CHAPTER 5: ARE WASHINGTON'S AVIATION SYSTEM FACILITIES, ACTIVITIES AND SERVICES ADEQUATE?

In 2005, 141 public use airports were included in the Washington aviation system. Airports included in the study are shown in the fold-out map on Page 5 of this report. The airports range in size from small facilities with turf runways to large, multi-runway commercial facilities.

The data tables presented in this section provide a statistical overview summarizing the current state of the Washington Aviation System. The tables provide an understanding what is happening at the airports and the range of airport facilities and services available. This information establishes the baseline conditions and sets the context for the airport and system capacity and performance analyses to follow. Information is arranged into three parts, which include:

- Overview of facilities, activities and services
- Summary of minimum criteria for all airports
- Detailed system performance presented by airport classification

The airport overview tables are not intended to provide a complete breakdown of all data compiled on Washington airports during the survey process. For more complete information on each airport in the state system, an inventory summary report for each airport is available.

State System Facilities, Activities and Services Overview

Most of the airport survey data presented below is categorized according to the proposed State Airport Classifications and addresses the performance and capacity measures summarized in Chapter 3 and 4 of the report. This information provides background information on how each airport operates and the types and sizes of aircraft using the airport. The Washington Aviation System data summarized in this section is presented according to proposed state classification and includes the following information:

- Management authority
- 2005 airport activity

- Scheduled commercial passenger carriers serving Washington airports
- Commercial cargo carriers serving Washington airports and 2005 enplaned tonnage
- Aviation-related services and activities
- Airport reference code
- Instrument approach capabilities
- Airside facilities available
- Aircraft apron and parking
- Landside facilities available

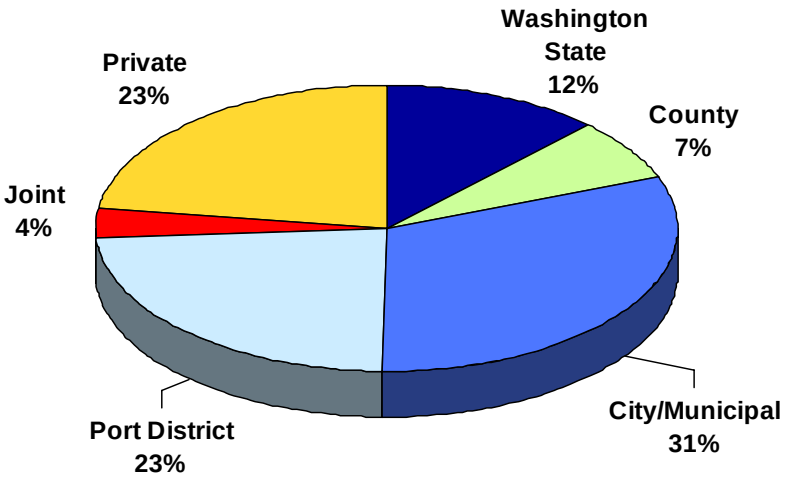
Who Operates Washington's Airports?

In most cases, the entity managing the airport also owns the facility. Over 75 percent of Washington airports are under a public ownership and management structure. Of the Commercial Service Airports, 73 percent are managed by port districts. Over 75 percent of the privately-owned airports in the state are recreational or remote airports.

Figure 56: Management Authority

Management Authority	Commercial Service	Regional Service	Local Community (More than 10 Aircraft)	Local Community (Less than 10 Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Washington State					17		17
County	1	2	2	4	1		10
City/Municipal		7	12	17	6	2	44
Port District	11	7	6	7		2	33
Joint	2	1		2			5
Private	1	1	1		23	6	32
Total Airports	15	18	21	30	47	9	141

Washington Airport System by Management Authority



Since the majority of the airports within the state are owned and operated by public entities it would imply a level of stability and commitment that does not always exist at private airports. Public airports have access to state and federal grant funding and are more likely to be operated and maintained at a higher level. Private airports tend to be less consistent with respect to maintenance and also less secure. Recently, Evergreen Airport, one of the state's private airports, was closed due to outside influences. Ports and cities are likely to see the airport as a vital part of a local transportation system and as being a component of a community's total economic development package.

Commercial Airport Activity Key Findings

Commercial Service and Regional Service airports have broad ownership across numerous categories. All airports operated by WSDOT Aviation are included in the Recreation or Remote classification. Mostly privately owned airports in the state aviation system are assigned to the Recreation or Remote classification.

What is Happening at Washington's Airports?

In Figure 57, 2005 airport activity levels reported by the state system airports for enplaned passengers, aircraft operations and enplaned cargo tonnages are listed. The Commercial Service Airports report the greatest activity levels for enplaned passengers and cargo.

Figure 57 provides a breakdown of activity by service level for the following indicators:

- Enplaned Commercial Passengers: The number of departing passengers boarding scheduled commercial aircraft.
- Total Based Aircraft: Total number of planes permanently stationed at the airport in 2005.
- Total 2005 Operations: The sum total of all aircraft takeoffs and landings at the airport in 2005.
- GA Local Operations: Local takeoffs and landings that include training or touch-and-go activity and by definition do not leave the airport's air traffic control area.
- GA Itinerant Operations: Takeoffs and landing are aircraft operations extending beyond the airport traffic area or entering the traffic area from the outside.
- Air Carrier Operations: Represents either a takeoff or a landing by a scheduled commercial airline with seating capacity of more than 60 or an all-cargo airline of comparable size.
- Air Taxi Operations: Commercial includes takeoffs and landings by aircraft with 60 or fewer seats conducted on non-scheduled or for-hire flights.
- Military Operations: Represent takeoffs and landings by Department of Defense aircraft, including rotorcraft.
- Ultralight Operations: The sum total of all glider aircraft take-offs and landings at the airport in 2005.
- Seaplane Operations: The sum total of all amphibian/water capable aircraft takeoffs and landings in 2005.
- Enplaned Cargo Tonnage: Total freight and mail volume departing the airport via aircraft in 2005.

Figure 57: 2005 Summary of Aircraft Operations

	Commercial Service	Regional Service	Community Local >10	Community Local <10	Recreation or Remote	Seaplane Base	Total
Total 2005 Operations	**1,442,540**	**1,383,106**	**624,007**	**96,334**	**452,876**	**86,940**	**4,085,803**
GA Local Operations	430,495	665,223	236,510	32,217	172,982	8,632	1,546,059
GA Itinerant Operations	416,707	655,657	354,264	56,341	277,525	15,428	1,775,921
Air Carrier Operations	408,102	0	0	0	0	10,240	418,342
Air Taxi Operations	246,461	34,954	30,463	7,377	906	52,640	372,801
Military Operations	25,471	27,275	2,770	400	1,465	0	57,381

Share of 2005 Operations by State Classification

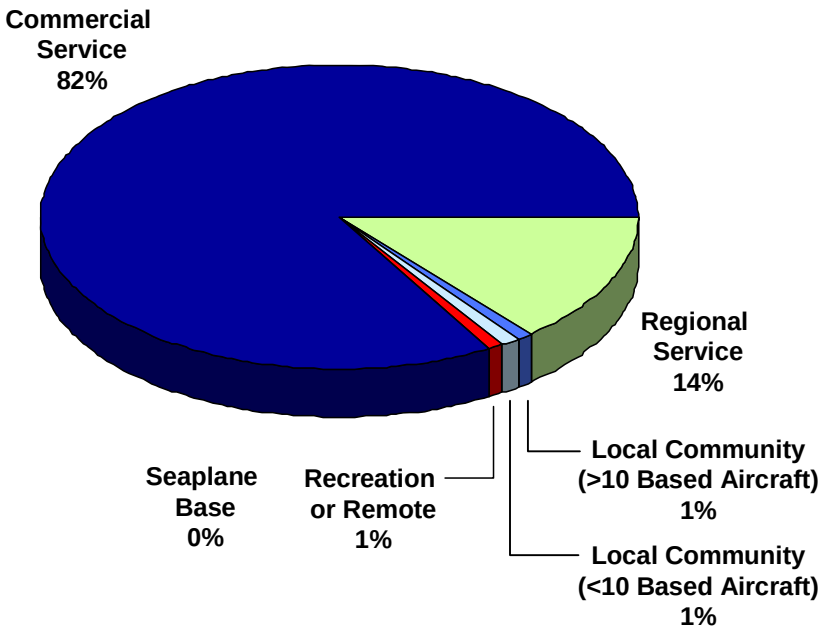


Figure 58 - Shows that the aviation system in Washington State is well balanced, providing the citizens of the state with the full range of aviation opportunities, as appropriate to the community that they serve. One unusual feature is the range of services available at seaplane facilities, representing WA's unique system. The high level of local general aviation operations suggest that significant flight training activities is likely occurring within the state.

Airport Activity Key Findings:

Commercial Service airports accommodate the majority of general aviation operations and based aircraft in the state aviation system. Cargo tonnage is concentrated at two airports, one Commercial Service and one Regional Service. Commercial air carrier operations make up a significant percentage of total operations in Washington.

Washington Airports with Commercial Passenger Service

Scheduled commercial passenger service was reported at 14 airports statewide in 2005. Not all airports reporting commercial passenger service are included in the state Commercial Service airport classification. Two airports reporting passenger service are classified as Regional Service Airports, two are Local Community Airports, and one is a Seaplane Base. In Figure 58, the reported number of individual passenger carriers serving the airport is presented for those airports with scheduled passenger service.

Figure 58: Number of Scheduled Commercial Passenger Carriers Serving Washington Airports

Airport	Commercial Service	Regional Service	Local Community (More than 10 Based Aircraft)	Local Community (Less than 10 Based Aircraft)	Recreation or Remote	Seaplane Base
Anacortes	1					
Bellingham International	4					
Boeing Field/King Co. Int'l	1	1				
Grant County International	2					
Kenmore Air Harbor SPB						1
Omak		1				
Pangborn Memorial	1					
Pullman/Moscow Regional	1					
Sea-Tac International	24					
Skagit Regional			1			
Spokane International	11					
Tri-Cities	3					
Vista Field			1			
Walla Walla Regional	3					
Wm. R. Fairchild Int'l	1					
Yakima Air Terminal	1					

Figure 58 shows the dominant role of Sea-Tac and Spokane International within the state's commercial service system. Seattle provides regional service to the state's smaller communities and Spokane provides limited regional service to a few Washington communities as well. All other Washington commercial service airports are essentially "spoke points" to Sea-Tac, Spokane or another hub carrier market such as Salt Lake City. Therefore Sea-Tac has a critical role for future air service development within the state and its constraint issues, along with market demand, will impact the commercial service environment in Washington. (e.g. If Sea-Tac's capacity constraints result in delays, the entire state system experiences delays).

Research into the recently initiated, non-Sea-Tac destined, services offered at Bellingham and Tri-Cities could offer some opportunities for growth beyond Sea-Tac and this may benefit passenger growth in underdeveloped regions in the state. Other non-hub air service development examples include Kenmore Air Service at Port Angeles and

Skagit flights to Boeing Field/King County International. Both represent a market trend that will continue to positively impact air service in the state, as well as increase the disproportionate development of air service on the west side of the Cascade Mountains.

Several airports currently listed as community service facilities have reported some form of commercial service available. It is important to track commercial airline development of regional service in smaller communities as this may result in more effective use of underutilized airport facilities.

Commercial Passenger Service Key Findings

Passenger carrier activity is concentrated at Sea-Tac and Spokane International. Multiple passenger carriers are also located at Bellingham International, Tri-Cities, and Walla Walla. Grant County International, formerly a subsidize Essential Air Service market, has recently lost its USDOT subsidy and its commercial service has been discontinued. Previously, Grant County had twice daily, 19-seat turbo prop service to Portland and one daily flight to Boise.

Washington Airports with Air Cargo Service

Airports reporting air cargo service are presented in Figure 59. Each airport is identified by proposed State Airport Classification, along with the number of cargo carriers serving the airport and 2005 enplaned cargo tonnage figures, where tonnages are available. Not all airports have the means or mechanism for recording cargo tonnage levels.

There are 15 airports in the state reporting service by all cargo carriers. The top three are Seattle Tacoma International, Spokane International, and Boeing Field/King County International. Each of these is recognized by FAA as having significant operations by cargo carriers and, consequently, is eligible for cargo entitlement money for improvements at the airport under the AIP. Of these three airports, Sea-Tac captures the largest percentage of total reported cargo tonnage statewide.

Of the remaining airports served by cargo airlines only two, Skagit Regional and Omak track the volume of cargo being enplaned at their facilities. The remainder, Anacortes, Grant County International, Kenmore Air Harbor, Pangborn Memorial, Pullman Moscow, Richland, Tri-Cities, Vista Field, Walla Walla Regional, and William R. Fairchild International all have service by cargo carriers operating small package feeder aircraft. In these cases the volume of cargo is small and not tracked by the airport, and therefore not reported on the following table.

Primarily, this cargo consists of small packages being shipped through either King County International/Boeing Field or Sea-Tac.

Figure 59: Number of Cargo Carriers Serving Airports and 2005 Enplaned Tonnage

Airport	Commercial Service	Regional Service	Local Community (More than 10 Based Aircraft)	Local Community (Less than 10 Based Aircraft)	Recreation or Remote	Seaplane Base
Anacortes	No. of Carriers	1		-	-	
Boeing Field/ King County International	No. of Carriers	6		-	-	
	2005 Enplaned Tons	45,630		-	-	
Grant County International	No. of Carriers	2		-	-	
Kenmore Air Harbor	No. of Carriers	-		-	-	
Omak	No. of Carriers	-		2	-	
	2005 Enplaned Tons	-		125	-	
Pangborn Memorial	No. of Carriers	5		-	-	
Pullman/Moscow Regional	No. of Carriers	1		-	-	
Richland	No. of Carriers	-		1	-	
Sea-Tac International	No. of Carriers	15		-	-	
	2005 Enplaned Tons	338,657		-	-	
Skagit Regional	No. of Carriers	-		1	-	
	2005 Enplaned Tons	-		1,060	-	
Spokane International	No. of Carriers	5		-	-	
	2005 Enplaned Tons	55,347		-	-	

Figure 59 shows that air cargo demand is concentrated at a limited number of airports in the state. This implies that the majority of cargo is shipped by truck or operates on a Regional/feeder airline basis from most small communities to Sea-Tac or Boeing Field/King County International, and to a lesser extent Spokane International. As is often the case, air cargo is consolidated and shipped via points where lift capacity (widebody aircraft) is available and frequent service is offered. Air cargo demand is dictated by the cost of an operation (air, surface, port) and the time-sensitive nature of goods and the shipper's willingness to pay a premium for air service. Because Sea-Tac and King County International/Boeing Field have frequent daily, widebody service they serve the majority of Washington State's air cargo needs currently.

Omak and Skagit volumes warrant further examination during Phase II. Are the activity levels being reported representative of opportunities and trends that could develop into the future and that can be leveraged by other airports? Or, are they specific, unique market driven situations contained to these airports?

Air Cargo Service Key Findings

Cargo activity concentrated at Sea-Tac, Spokane International and Boeing Field. Cargo tonnage is also recorded at Skagit Regional and Omak and should be evaluated further. Remaining airports are served by cargo airlines operating small package feeder aircraft.

Which Facilities and Services are Available at Washington's Airports?

Washington Airport Services and Aviation-Related Activities

Data on the type of aviation-related services and activities taking place at Washington airports was collected during the survey process. The individual airport data has been consolidated and summarized in Figures 60 and 61 on the following pages. In the figures, the number of airports reporting the service or activity is identified. This is an indicator of existing services in Washington's aviation system. Phase II of LATS will evaluate capacity to determine if existing facilities are sufficient to meet expected demand for these services and activities in the next 20 years.

The services listed represent a wide range of aviation-related business activities that support the needs of both based as well as transient aircraft. The availability of the services listed in the table contributes to the overall attractiveness and viability of the facility. In addition, they represent a potential source of revenue to the airport owner/operator through such means as land leases and fuel flowage fees, or other income such as tie-down fees.

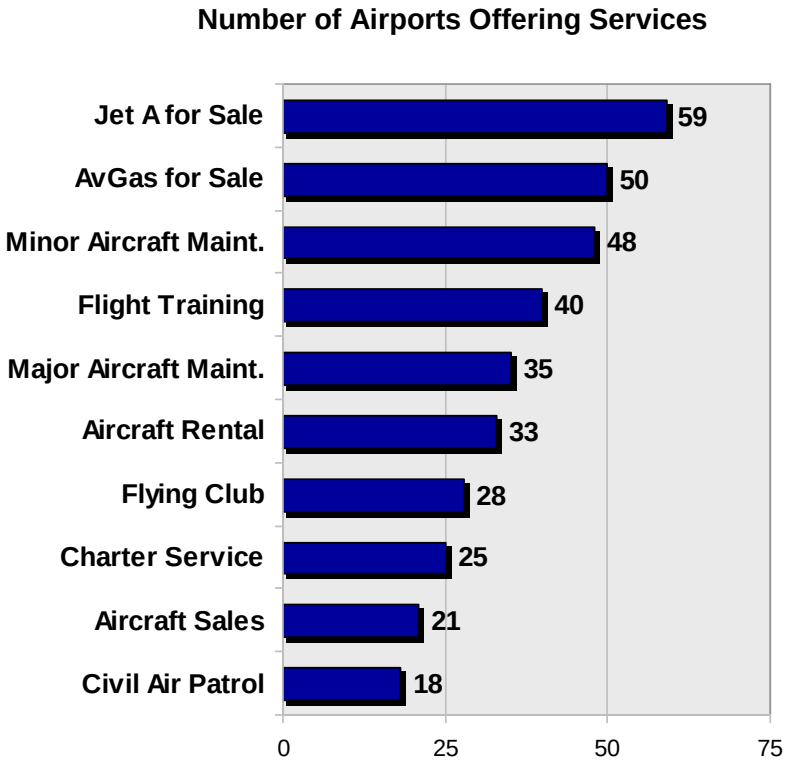
As is apparent from Figure 60, in most instances it is the Regional Service Airports that provide the greatest level of service to the general aviation community. This is a logical finding in that the Commercial Service Airports are managed more to address the needs of commercial aviation and consequently have facilities and pricing structures which exceed the needs of a large segment of the general aviation community.

The summary table also shows that many of Washington's airports offer a number of aviation-related services within the state but that pilots based at small airports may have to travel to one of the regional service airports to gain access to certain services. FBOs at the largest airports are able to offer a variety of services that FBOs in smaller markets are not. One area of further research may be to explore whether the FBO business health is a better indicator of corporate jet activity than the number of based aircraft.

Figure 60: Number of Airports with Specific Services and Activities

	Commercial Service	Regional Service	Local Community >10	Local Community <10	Recreation or Remote	Seaplane Base	System Total
Major Aircraft Maintenance	10	12	8	1	3	1	35
Minor Aircraft Maintenance	10	16	16	1	5		48
Avionics	6	5	2		2	1	16
Aircraft Rental	10	13	7	1	2		33
Aircraft Sales	6	7	5		2	1	21
Flight Training	10	14	9	3	3	1	40
Charter Service	11	10	1	1	1	1	25
US Customs	5	5	2			1	13
Food Service	5	9	3				17
Lodging	1	3	1				5
Flying Club	3	11	10	1	3		28
Wildland Firefighting	2	5	1		1		9
Civil Air Patrol	4	9	5				18
Other Search/Rescue/ Disaster Assistance	1	5	3	1	1		11
Law Enforcement	4	3	5		1		13
Air Show		3	1				4
Skydiving/Parachute Drops		4	1				5
Agriculture Spraying	2	2	8	3	1		16
Aerial Surveying		5	2	1	1		9
Airplane / Parts Manufacturing	5	6	1	1	3	1	17
Military Aircraft Activity	5	4	1		1		11
Fuel Sales							
– Jet A for Sale	10	16	10	5	16	2	59
– AvGas for Sale	12	16	15	2	4	1	50

Figure 61: Top 10 Services at Airports Statewide



Airport Services and Aviation-Related Activities Key Findings

Although Regional Service airports have fewer annual operations, they tend to provide more aviation services and activities for general aviation pilots than Commercial Service facilities. These activities include major and minor maintenance, fuel sales and aircraft rental.

Airport Reference Code

Each airport in the state system is assigned an Airport Reference Code (ARC) designation. The FAA's Airport Reference Code is a classification system developed to relate airport design criteria to the operational and physical characteristics of the airplanes expected to operate at the airport. A Critical Aircraft is selected for each airport, which is the most demanding aircraft expected to generate 500 or more itinerant operations per year. The ARC is used to identify capital facility improvements necessary to adequately serve that aircraft. A review of current ARC designations for Washington's aviation system is an indicator of which airports are expected to serve various sizes of aircraft, and the types of improvement projects that will be required.

The ARC is based on two key characteristics of the designated Critical Aircraft (Figure 62 on the next page). The first characteristic, denoted in the ARC by a letter, is the Aircraft Approach Category as determined by the aircraft's approach speed in the landing configuration. Generally, aircraft approach speed affects runway length, exit taxiway locations, and runway-related facilities. The ARC approach speed categories are as follows:

- Category A: Speed less than 91 knots;
- Category B: Speed 91 knots or more, but less than 121 knots;
- Category C: Speed 121 knots or more, but less than 141 knots;
- Category D: Speed 141 knots or more, but less than 166 knots; and
- Category E: Speed 166 knots or more.

The second ARC component, denoted by a Roman numeral, is the Airplane Design Group. The Airplane Design Group is defined by the aircraft's wingspan and determines dimensional standards for the layout of airport facilities, such as separation criteria between runways and taxiways, taxi lanes, buildings, or objects potentially hazardous to aircraft movement on the ground. The Airplane Design Group categories include:

- Design Group I: Wingspan up to but not including 49 feet;
- Design Group II: Wingspan 49 feet up to but not including 79 feet;
- Design Group III: Wingspan 79 feet up to but not including 118 feet;
- Design Group IV: Wingspan 118 feet up to but not including 171 feet;

- Design Group V: Wingspan 171 feet up to but not including 214 feet;
- Design Group VI: Wingspan 214 feet up to but not including 262 feet.

Figure 62: Airport Aircraft Reference Codes

Note: Aircraft pictured are identified in bold italic type
Source: W&H Pacific

The number of state system airports within each ARC is listed in Figure 63. The ARCs listed represent those currently applicable. Subsequent analyses will determine whether each airport's ARC should be revised once the demand forecasts have been completed.

Figure 63: Number of Airports by Airport Reference Code

Airport Reference Code (ARC)	Commercial Service	Regional Service	Local Community (More than 10 Based Aircraft)	Local Community (Less than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
A-I			1	1	1		3
A-I (small)	4	2	14	13	45	9	87
A-II		3	1	1	1		6
B-I	1			3			4
B-I (small)			5	9			14
B-II		9		3			12
B-III	2						2
C-II		2					2
C-III	4						4
C-IV	1						1
D-II		1					1
D-V	3						3
E-V		1					1
Total	**15**	**18**	**21**	**30**	**47**	**9**	**140**

Figure 63 - Shows that most airports in the state are designed for use by small aircraft (BII or smaller). Does this mean that private aviation facilities in the state are more plentiful than commercial facilities? The distribution implies a healthy and safe operational environment for private pilots but suggests that most communities do not have facilities that can be used by corporate aircraft on a regular basis.

Airport Reference Code Key Finding

A majority of Washington's airports are designed for use by small aircraft and the large aircraft in categories D-V & E-V can only be accommodated at four airports.

Washington Airport Approach Capabilities

Airport approaches are either visual or instrument. Visual approaches are the least technical. Airports that have visual approaches can be used by pilots of all skill levels, and can be used in good weather conditions where pilots can fly by sight. Instrument approaches provide technologies that allow qualified pilots to fly using aircraft instrument controls rather than relying solely on sight. The two levels of instrument approaches are Precision and Non precision. Airports with instrument approaches allow access in varying weather conditions and provide greater capacity. A review of the types of approaches available at Washington's airports allows analysis to identify areas that are adequately or inadequately served by all-weather aviation access, and is used in capacity evaluation.

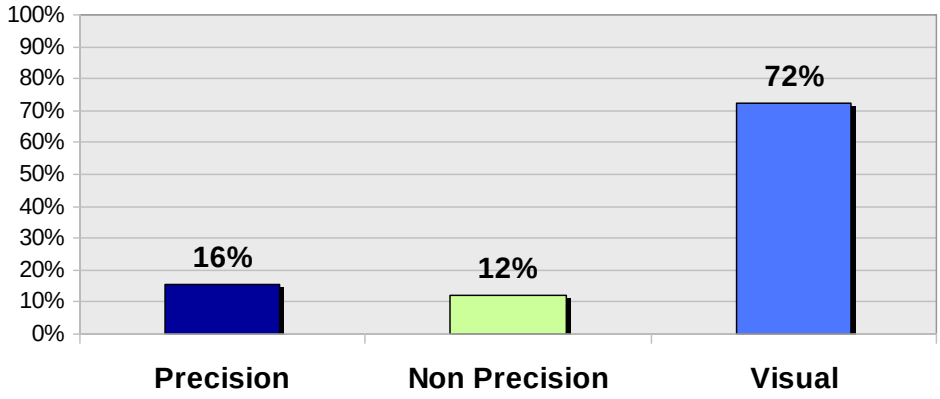
State system airports were surveyed to determine the highest existing instrument approach capabilities currently provided at the airport. Instrument approach capabilities were categorized as either Precision or Non precision based on the approach(es) available at the airport. Airports without instrument approach capabilities were categorized as Visual. Where different runway ends support different approach capabilities, airports were asked to report the highest degree of precision available. The level of precision assigned to an airport is to determine the existing conditions and makes no judgment as to any potential future or enhanced instrument approach capabilities at the facility.

The number of state system airports supporting Precision and Non precision instrument approaches is presented by service level classification in Figure 64 on the following page. Not surprisingly, it is the Commercial Service Airports that have the greatest number of precision approaches of airports system-wide. The data indicate that most airports in the state have only visual approaches (including two of the commercial service facilities - probably seaplane bases). This is typical in a system dominated by BII and smaller facilities. The emerging technologies that are being developed and applied to instrument flying however would suggest that over the next several years the number of available instrument approaches will increase.

Figure 64: Instrument Approach Capabilities

Capability	Commercial Service	Regional Service	Local Community (More than 10 Based Aircraft)	Local Community (Less than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Precision	11	6			4	1	22
Non Precision	2	9	1	4	1		17
Visual	2	3	20	26	42	8	101
Total Number of Airports	**15**	**18**	**21**	**30**	**47**	**9**	**140**

Percent of Washington Airports by Visual Approach Capabilities



Instrument Approach Capability Key Findings

A majority of Commercial Service airports have precision approach capability, supporting 24-hour, all-weather access. Precision approaches are also provided at six Regional Service airports and four Recreation or Remote airports. The majority of Washington's airports use visual approaches and cannot support 24-hour, all-weather access.

Washington Airport Airside Facilities Available

Airport data collected during the survey provided runway and taxiway data that will be used in subsequent capacity calculations for each airport. The number of runways indicates total system capacity, while runway length and pavement condition are indicators of the type of aircraft served. Figure 65 includes, summarized by proposed State Airport Classification:

- Number of runways provided at airports within the state system
- Longest runways available
- Number of airports providing only a single runway
- Number of airports providing multiple runways
- Breakdown of runway lengths into five categories, from less than 3,000 feet to 10,000 feet or greater

Figure 65: Airside Facilities

Capability	Commercial Service	Regional Service	Local Community (More than 10 Based Aircraft)	Local Community (Less than 10 Based Aircraft)	Recreation or Remote	Seaplane Base
Total Runway Count	31	35	21	32	53	13
Longest Runway	13,502	9,010	4,199	6,700	5,049	12,000
Single Runway Airports	4	6	21	28	40	5
Multiple Runway Airports	11	12		2	6	4
Runway Lengths						
Less than 3,000’	3	6	11	12	37	3
3,000 to 3,999’	7	7	8	14	11	
4,000 to 4,999’	3	9	2	4	4	
5,000 to 9,999’	13	13		2	1	6
10,000’ or Greater	5					4
Total Runway Count	**31**	**35**	**21**	**32**	**53**	**13**
Longest Runway	**13,502**	**9,010**	**4,199**	**6,700**	**5,049**	**12,000**

Figure 66: Runway Counts Statewide by State Classification

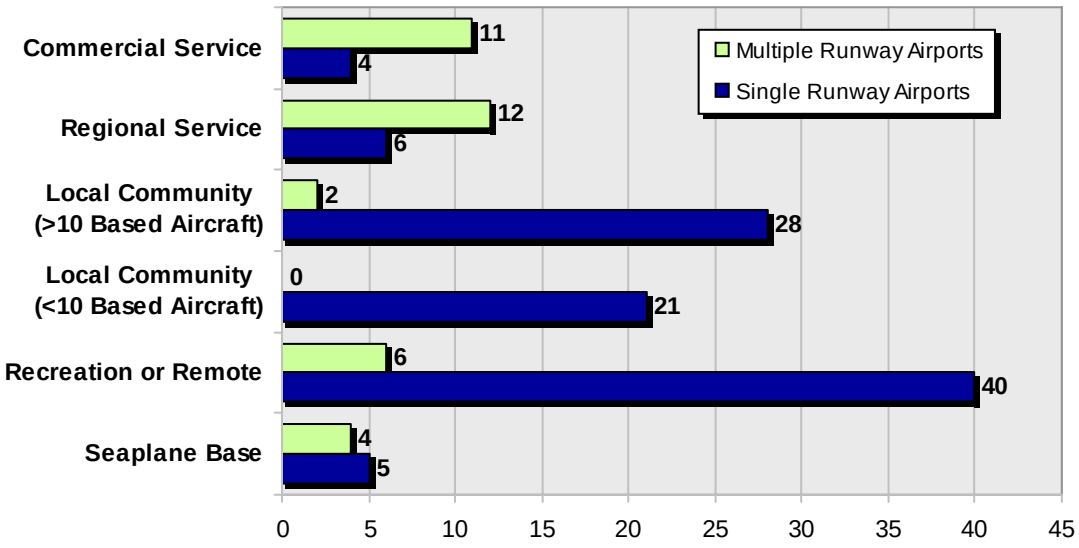
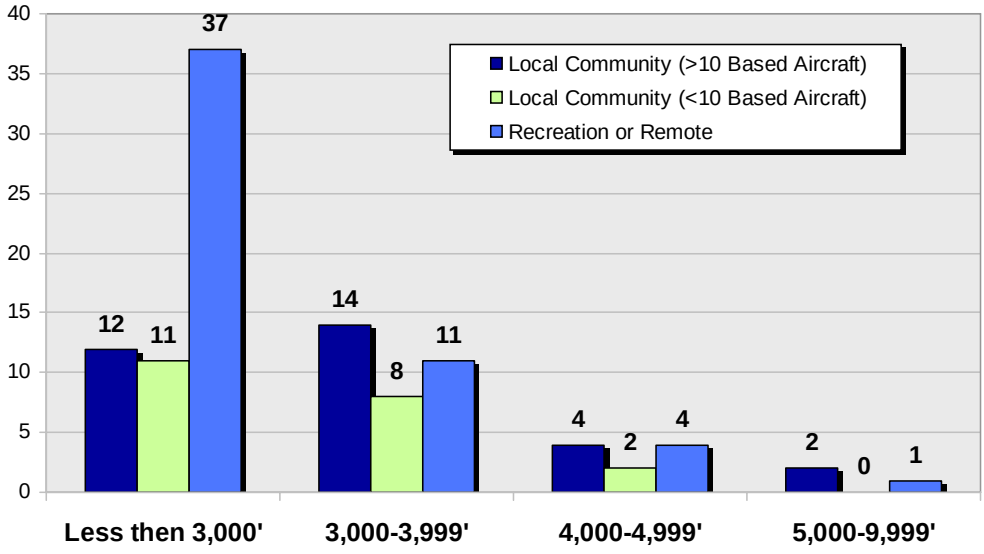


Figure 67: Runway Lengths Statewide by State Classification



Airside Facilities Key Findings

A majority of multiple runway airports in Washington State are in the Commercial Service and Regional Service classifications. A majority of Washington's airport runways are 3,000 feet long or less.

Pavement Condition

Pavement condition is measured and tracked to develop strategies for maintenance and rehabilitation that result in the lowest life cycle cost for paved facilities in Washington's aviation system. The importance of identifying the type of repair and optimal time of repair is critical for overall system performance and for managing improvement costs because there is a point in a pavement's life cycle where the rate of deterioration increases. The financial impact of delaying repairs beyond this point can be severe.

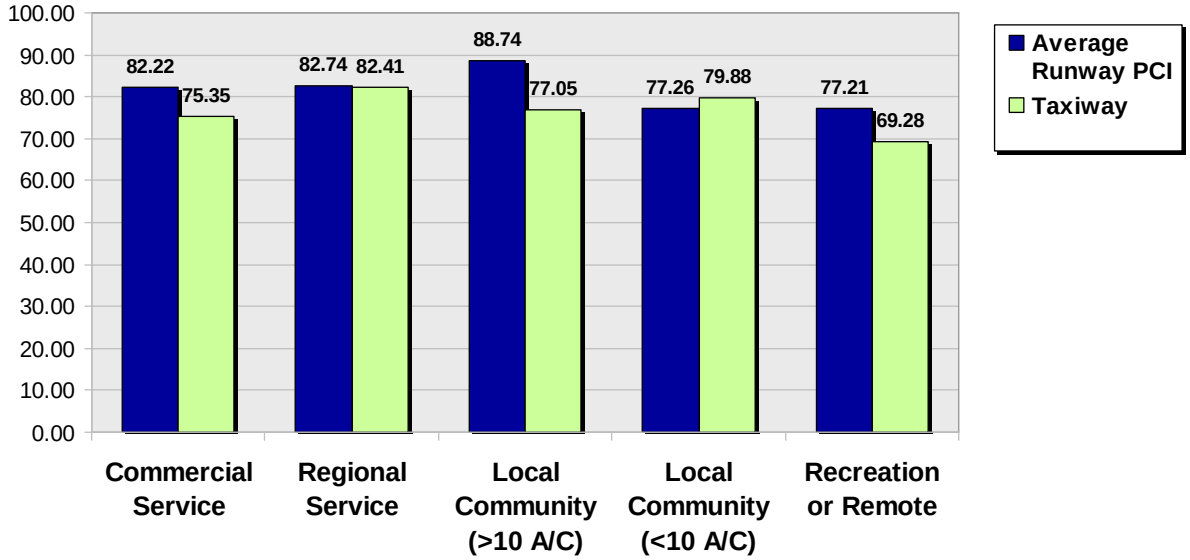
The FAA standard for monitoring the condition of airport pavements is the pavement condition index (PCI) system. This pavement evaluation system establishes a pavement condition index number between one and 100 for each section of pavement. Pavements considered to be in excellent condition have a high PCI index numbers, and those in poor condition have low index numbers. The types of distress identified during the PCI inspection provide insight into the cause of pavement deterioration. Understanding the cause of pavement distress helps in selecting a rehabilitation alternative that corrects the cause and eliminates its recurrence. Monitoring, documenting and maintaining PCI index help support the overall airport system and allow for systematic prioritization of maintenance decisions/treatment and repair.

Figure 68: Average Airport PCI Values

		Local Community				
	Commercial Service	Regional Service	(>10 Based Aircraft)	(<10 Based Aircraft)	Recreation or Remote	Seaplane Base
Max Runway PCI	100	100	100	100	100	-
Average Runway PCI	82.22	82.74	88.74	77.26	77.21	-
Min Runway PCI	45.37	55.28	50.45	13	42	-
Max Taxiway PCI	86.56	91.87	100	100	100	-
Average Taxiway PCI	75.35	82.41	77.05	79.88	69.28	-
Min Taxiway PCI	57.48	66.22	21.34	25.8	36.84	-

Source: WSDOT Aviation PCI Study by Applied Pavement Technology, July 2006

Figure 69: Average Runway and Taxiway PCI by Washington State Airport Classifications (2005)



Note: Avg Pavement Condition Index (PCI) for runways, 100 represents new pavement, 0 completely failed

Pavement Condition Key Findings

On average, Washington's runway pavements are in good condition. Overall runway pavements in the state system are performing slightly better than taxiway pavements.

Washington Airport Aircraft Parking

The ability of Washington airports to accommodate aircraft on the ground will be an important factor in determining both individual airport as well as state system capacity. It indicates the ability to accommodate visiting aircraft, passenger traffic and cargo activity. In Figure 70 below, the total square footage of terminal and cargo apron available to support commercial operations is presented by proposed State Airport Classification. In addition, the total number of apron and transient tie down positions for based and transient aircraft are also summarized.

Figure 70: Aircraft Parking

	Commercial Service	Regional Service	Local Community (More than 10 Based Aircraft)	Local Community (Less than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Terminal Apron (Sq. Ft.)	943,100	413,042	30,000	8,000	8,000	-	1,402,142
Cargo Apron (Sq. Ft.)	5,275,500	456,000	-	-	-	-	5,321,100
No. of Apron Tie downs	827	1,290	459	73	458	68	3,175
No. of Transient Tie downs	387	487	248	87	114	5	1,328
Total No. of Tie downs	**1,214**	**1,777**	**707**	**160**	**572**	**73**	**4,503**
Total Parking Apron (Sq. Ft.)	**7,934,603**	**4,681,341**	**2,977,480**	**514,480**	**462,195**	**1,000**	**16,575,789**

Airport Aircraft Parking Key Finding

System-wide, utilization of aircraft storage and parking capacity is approximately 85 percent.

Washington Airport Landside Facilities

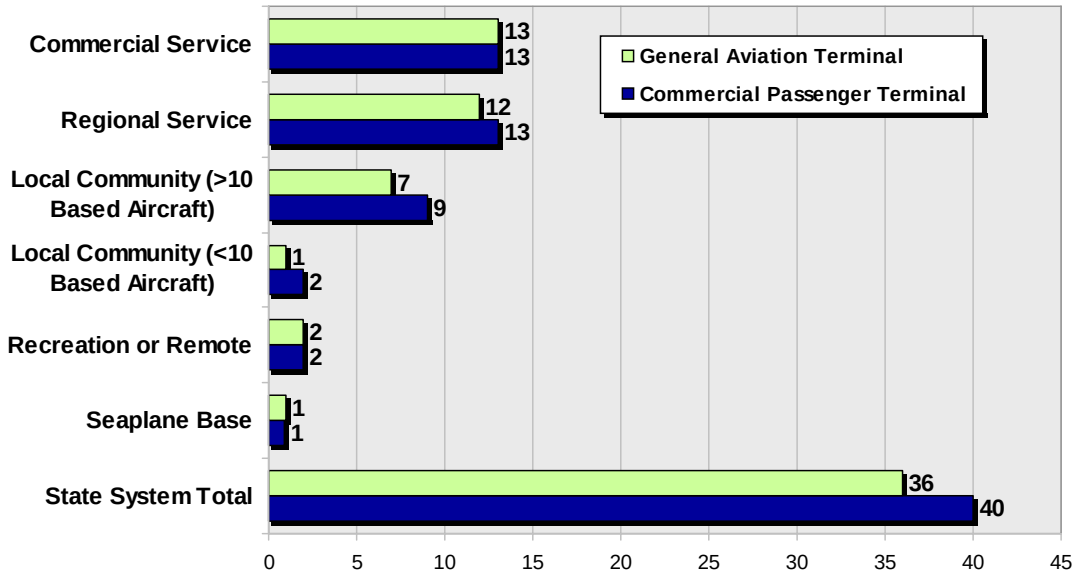
The final data set summarized in this overview addresses the number of airports throughout the state providing passenger and/or general aviation terminal facilities. The total number of hangars reported at system airports are also presented and categorized by hangar door opening - less than 50 feet, greater than 50 feet, or other to indicate the size of aircraft that can be accommodated. Lastly, the total number of public automobile parking spaces available are presented. These measures are indicators of the capacity of the aviation system to accommodate commercial service and general aviation activities.

As the survey showed, 36 airports in the state have passenger terminals for commercial activity and 40 have general aviation terminals regardless of the category of the airport. These facilities provide for a high level of service for airport users in the state, whether they are based within the state or visiting from outside the area. Also, there are more than 3,894 hangars available at airports across the state. Follow-up phone calls to the airport mangers revealed that some of the hangars classified as "other" housed more than one aircraft.

Figure 71: Landside Facilities

	Commercial Service	Regional Service	Local Community (More than 10 Based Aircraft)	Local Community (Less than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Commercial Passenger Terminal	13	12	7	1	2	1	36
General Aviation Terminal	13	13	9	2	2	1	40
Individual Hangar <50'	441	2,011	516	89	493	-	3,550
Individual Hangar >50'	255	504	209	12	78	-	1,058
Other Hangars	226	100	159	15	99	-	599
Public Auto Parking	20,032	1,727	557	100	181	102	22,699

Washington Airports by Passenger and GA Terminals



Airport Landside Facilities Key Findings

The majority of hangars available systemwide are located at Regional Service airports. Terminals for passenger and general aviation are concentrated at Commercial Service and Regional Service airports.

How is Aviation System Performance Assessed?

The previous section presents an overview of the Washington State aviation system, using the framework of the proposed state airport classifications to present a general understanding of who operates the airports, what is happening at the airports, and which facilities and services are available at the airports. The following assessment evaluates how well the airport system is performing, also using the framework of the proposed State Airport Classifications. This performance assessment of airport facilities and services relates to the type, rather than the amount of aviation activity. The amount of aviation activity—airport capacity--is addressed in Chapter 4 of this report.

The state classification system identifies minimum criteria that apply to all public-use airports, and specific minimum criteria appropriate to the role and function of airports assigned to each classification level.

How is the System Performing on Minimum Criteria that Apply to All Airports?

WSDOT Aviation proposed the following minimum criteria for all public use airports:

- Visual navigational aids (rotating beacon, segmented circle, and wind cone)
- Local support
- Operational safety issues
- Compatible land use policies and zoning

Visual Navigational Aids

Airport visual aids are used to provide information and guidance to pilots maneuvering on airports. These aids may consist of single units or complex systems of many parts and are adapted to each individual airport. As airports provide a unique working environment, with aircraft traveling at high speeds, multi directions, and under a variety of weather conditions, maintaining a uniform system of navigational aids provides for a safer and more efficient aviation environment. Visual Navigation Aid systems support safe operations.

- A rotating beacon is a lighting system that supports nighttime operations. The systems are not required unless the airport is approved for night operations or has a published instrument approach.
- A segmented circle is a system of visual indicators designed to provide traffic pattern information at airports without operating control towers.
- A wind cone provides pilots with a visual cue of the strength and direction of the wind at the landing surface.

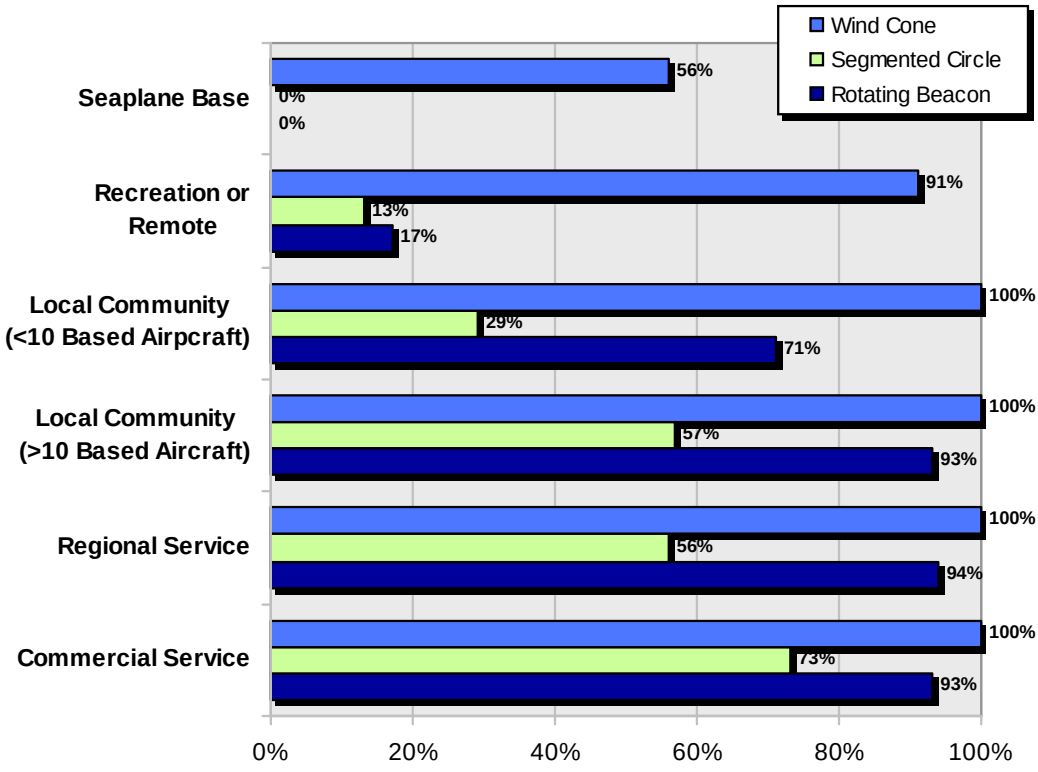
Figure 72 indicates the percentages of airports that have rotating beacons, segmented circles, and wind cones. Seaplane Bases are the most deficient regarding the visual navigational aids criteria. Most are used in daylight hours only, so a rotating beacon is not required. Also, it is difficult to provide a wind cone and segmented circle near the landing area when the landing area is water. Few of the Recreation or Remote Airports have rotating beacons or segmented circles. Some Recreation or Remote

Airports are not used at night so a rotating beacon is not required; also, they may have so little traffic that a segmented circle is unnecessary.

Figure 72: Visual Navigational Aids – Airports Meeting the Criteria

	Commercial Service	Regional Service	Local Community (More than 10 Based Aircraft)	Local Community (Less than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Rotating Beacon	93%	94%	71%	93%	17%	0%	59%
Segmented Circle	73%	56%	29%	57%	13%	0%	36%
Wind Cone	100%	100%	100%	100%	91%	56%	94%
Rotating Beacon	93%	94%	71%	93%	17%	0%	59%

Airports by State Classification and Visual Navigational Aids



Visual Navigational Aids Assessment Key Findings

With the exception of Seaplane Bases, all Washington airports have a high compliance for providing a wind cone (91-100%). Commercial Service, Regional Service and Local Community airports with ten or more based aircraft report high compliance in providing a rotating beacon. Significantly fewer airports have a segmented circle. The highest numbers of these visual indicators are available at Commercial Service airports.

Local Support

This measure is an indicator of a community's ability and willingness to support maintenance and improvement of its airport. Local Support is not easy to quantify; however, the ability to finance the local share of federal and state airport improvement grants is one indicator.

Roughly half the public use airports reported medium or high ability to match grants. About three-fourths of the Commercial Service, Regional Service, and Local Community (at least 10 Based Aircraft) Airports reported medium or high ability to match grants. Not surprisingly, the ability to match grants is lower at the smaller airports.

Financial support is only one component of local support, however. Because the grant match amount is so low, typically five percent of an AIP-funded project at a NPIAS airport, local match money is relatively easy to obtain. The support of politicians, civic organizations, and neighborhood is a factor. Do these groups support airport expansion as well as preservation? Phase III of LATS will address this question for airports that are expected to require additional capacity.

Operational Safety Issues

Many airports in the aviation system do not currently meet many of the FAA standards for airport runway width, taxiway separation and other issues that contribute to a safe aviation system. Determining that an airport has no operational safety issues is difficult to measure. In 2003 an extensive effort was conducted to assess existing airport conditions with minimum FAA standards. The development of airport master plans and airport layout plans has also helped to identify issues related to confusing taxiway patterns or other factors that increase the potential for collisions and near-misses at airports, referred to as runway incursions.

While the 2003 database contains information about compliance with FAA design standards, detailed analysis of this issue was not undertaken

as part of the 2006 update. Instead, the information was reviewed by the consultant team to determine whether any changes had occurred at the airport since 2003 that could affect the capacity of the facility or the system. This included a review of Master Plans and Airport Layout Plans that had been updated after 2003 and, where necessary, follow-up conversations with airport management.

Statewide, 71 percent of airports report obstruction-free approaches; however, only 40 percent of Commercial Service Airports and 50 percent of Regional Service Airports report their approach surfaces are free of obstructions. This circumstance may be less serious than it appears, because a penetration of the imaginary approach surface is not necessarily hazardous to air navigation, a determination that only the FAA can make.

Because safety is typically the first priority for airport improvement programs, it may be appropriate to identify compliance with critical airport design standards, such as the runway safety area, threshold siting criteria, or obstacle free zones, for future performance assessment.

Compatible Land Use and Zoning

The primary purpose of land use controls around an airport is to protect the airport environs from encroachment that could compromise the integrity of the airport operations, now or in the future. In Washington, state law requires towns, cities and counties to discourage development of incompatible land uses adjacent to public-use airports through adoption of comprehensive plan policies and development regulations. Communities that are considered "fully planning" under Washington's Growth Management Act are also required to recognize those airports as essential public facilities.

Figure 73 indicates that the airport system is not performing very well with regard to these indicators, according to information provided in 2003 and updated in 2006. The factors assessed for compatible land use policies and zoning follow:

- ***The airport zoning designation is appropriate.*** The survey asked respondents to indicate how the airport is zoned. The zoning designations Airport, Industrial, and Public Use are assessed as appropriate zoning and are reported at 41 percent of the airports. Unfortunately, 56 airports' zoning was listed as "Unknown" in the online survey.

- ***Runway protection zones (RPZ) are owned by the airport.*** The RPZ is an area off each runway end whose purpose is to enhance the

protection of people and property on the ground. The RPZ size ranges from eight to 79 acres, depending on the critical design aircraft and the type of approach. FAA design standards prohibit residences and places of public assembly (churches, schools, hospitals, etc) in RPZs. Statewide, 61 percent of the public use airports own the RPZ and are therefore able to control development in that area.

- ***City and County plans include the airport as an essential public facility.*** This is reported for only 17 percent of the airports in the state. Even in the Commercial Service Airport classification, only a third of the airports are designated essential public facilities in city and county plans.

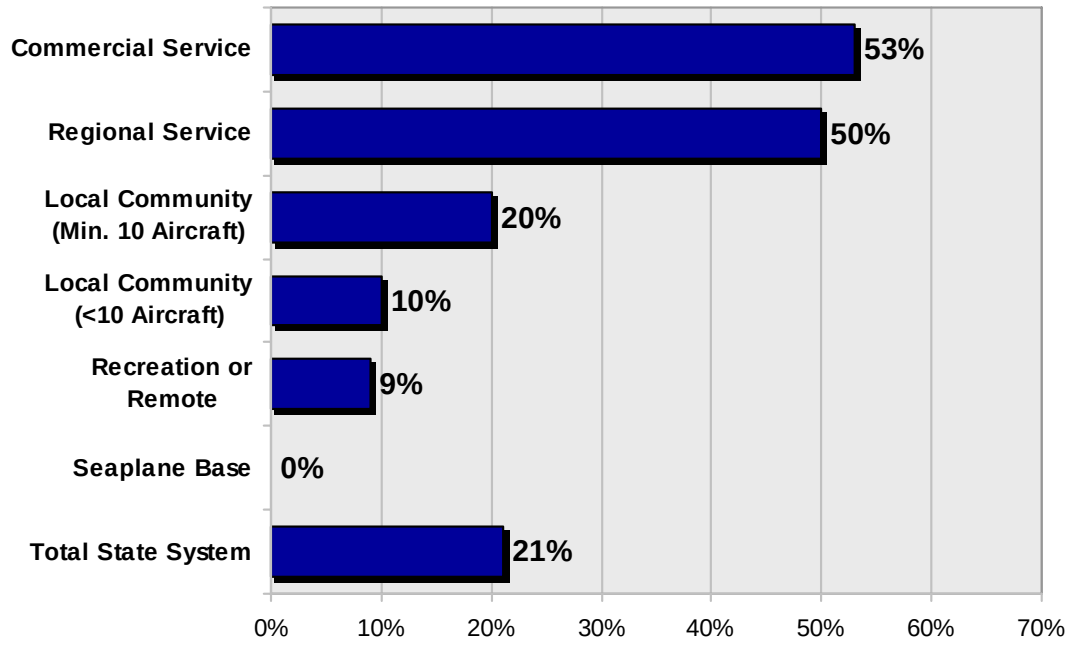
- ***Zoning is in place to regulate height hazards.*** Height hazard zoning is reported at 40 percent of the airports.

- ***Current development regulations prohibit incompatible development adjacent to the airport.*** Only 21 percent of the airports answered yes to this survey question.

Figure 73: Compatible Land Use and Zoning – Airports Meeting the Criteria

	Commercial Service	Regional Service	Local Community (More than 10 Based Aircraft)	Local Community (Less than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Airport zoning designation is appropriate.	80%	67%	33%	63%	15%	0%	41%
Runway Protection Zones (RPZ) are owned by the airport sponsor.	73%	72%	43%	40%	70%	78%	61%
City and County plans include airport as essential public facility.	33%	44%	19%	20%	2%	0%	17%
Zoning is in place to regulate height hazards.	60%	83%	24%	73%	11%	0%	40%
Current development regulations prohibit incompatible development adjacent to the airport.	53%	50%	10%	20%	9%	0%	21%

Airports that Prohibit Incompatible Adj. Dev. By State Classification



Compatible Land Use and Zoning Assessment Key Findings

Overall, many airports are zoned appropriately and own associated Runway Protection Zones. Performance on regulations to discourage development of incompatible land uses is highest among the busiest passenger facilities including Commercial and Regional Service airports, however, a majority of airports system-wide do not meet all minimum criteria for compatible land use and zoning.

Airport Zoning

Appropriate on-airport zoning is also important to protecting airports from incompatible land uses that could compromise the integrity of airport operations. Airport, Industrial, and Public Use are zoning designations that are appropriate for airport property.

Obstructions

Obstructions are objects such as terrain, buildings, trees, and vehicles that could be hazardous to aircraft during takeoff or landing. Imaginary surfaces around runways, which are defined by 14 CFR Part 77, Objects Affecting Navigable Airspace, should be kept clear of obstructions. If construction or vegetation around an airport is allowed to obstruct an imaginary surface, particularly the approach surface, the FAA can impose measures that degrade the usefulness of an airport for safety reasons. A runway threshold might have to be displaced, which would shorten the useable runway. Shortening the useable runway could reduce the types of aircraft that could use the runway or reduce aircraft payloads or fuel loads, which could result in a negative economic impact on the local community and on the aircraft operator. If a runway has an instrument approach, the FAA might raise the visibility minimums for the instrument approach, in order to keep landing aircraft a safe distance above an obstruction. Higher visibility minimums increase the amount of time an airport is closed due to weather, which reduces availability of the airport for emergencies, as well as for business and recreation purposes.

How is the Aviation System Performing On Specific Minimum Criteria Set for Airport Classifications?

The following sections assess the performance of the different airport classifications according to their individual criteria. The criteria proposed for individual airport classifications relate to the same types of facilities and services, but are calibrated to each classification. In other words, the criteria are more demanding for the larger airports.

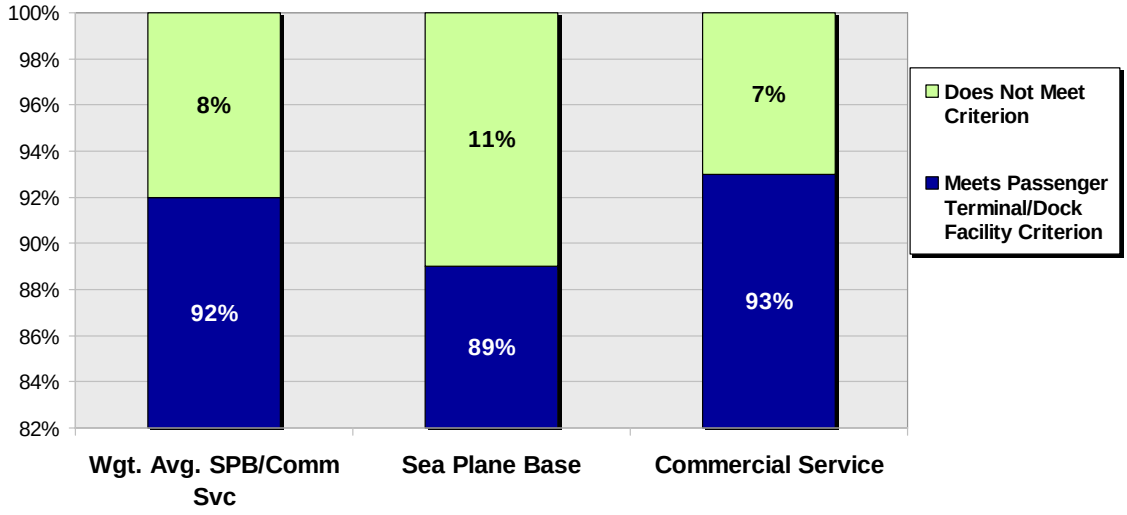
The figures in this section compare how well the different airport classifications are performing with respect to the passenger, runway length, taxiway, runway lighting, approach, vertical glide slope indicator, weather reporting, fuel sales, and maintenance criteria.

Passenger Terminal

Having a passenger terminal is critical to having scheduled commercial service at an airport. Aside from the obvious benefits of protecting travelers in inclement weather, comfort and convenience is part of the travel experience that is a minimum expectation for both airlines and passengers. The objective to have a passenger terminal applies only to Commercial Service Airports, although it would be desirable to have a building for arriving and departing passengers at Regional Service Airports and at the larger Local Community Airports to facilitate future conversion for passenger service, if necessary. Information about the availability of passenger terminals at these other classifications is presented below.

Figure 74 summarizes an assessment of passenger facilities. Only Commercial Service Airports have a criterion to have a passenger terminal, which almost all have. Only one has no building, but requires passengers to load and unload on the apron. Sea Plane Bases have a criterion to have a dock facility, which supports passenger loading and unloading. Most of the Sea Plane Bases have a dock facility.

Figure 74: Passenger Facility Criteria Assessment



Passenger Term Passenger Terminal Assessment Key Finding

Most commercial airports and seaplane bases provide passenger terminals.

Runway Length

The runway length performance criterion for each state classification is based on accommodating the type of aircraft and/or the instrument approach level that is appropriate for the airport role. The runway length an aircraft needs depends on a combination of factors, including aircraft performance characteristics, operating weight, temperature, airport elevation, runway gradient, and runway surface condition. In addition, the FAA specifies minimum lengths for runways to have instrument approaches using WAAS and other navigational aids, dependent upon the approach visibility minimums.

Runway length should be determined for the critical design aircraft, which is the most demanding aircraft in regular or substantial use at the airport. The design temperature used in the length calculation is the mean maximum temperature in the hottest month; the design temperatures at Washington airports generally fall between 65 and 85 degrees F. Performance objectives for runway length are shown in Figure 75 on the following page.

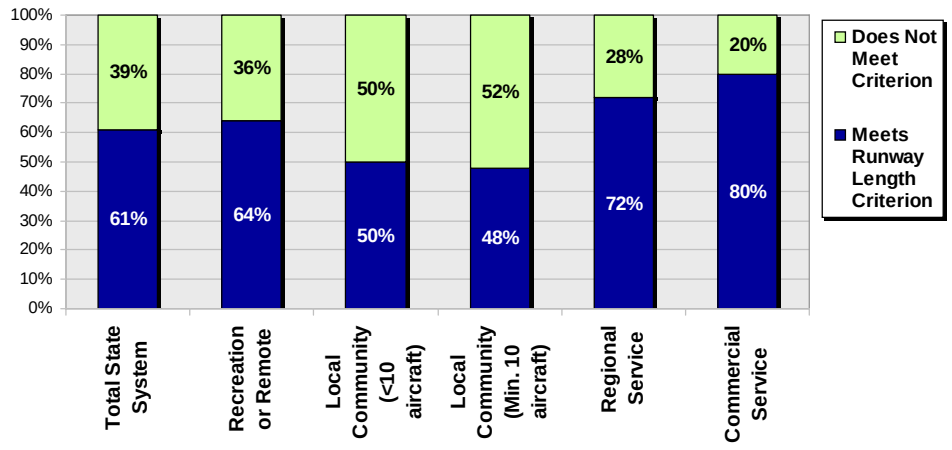
Figure 75: Runway Length Performance Objective

Airport Classification	Runway Length	Purpose
Commercial Service	5,500 feet	Accommodates heavy business jets
Regional Service	5,000 feet	Accommodates medium business jets
Local Community (At least 10 Based Aircraft)	3,200 feet	Required for an instrument approach
Local Community (Fewer than 10 Based Aircraft)	2,800 feet	Length required for 95% of small aircraft
Recreation or Remote	2,400 feet	Length required for 75-95% small aircraft

Note: Longer runway lengths may be justified based on runway length analysis conducted according to the FAA Advisory Circular 150/5325-4B, Runway Length Requirements for Airport Design.

Figure 76 shows that most of Washington's airports meet their runway length criteria, however, every airport classification has significant deficiencies. Less than half of Local Community Airports with at least 10 based aircraft meet the FAA's minimum runway length for an instrument approach (without penalties to the approach visibility minimums). This translates to 16 airports that cannot realize the full benefit of a WAAS approach.

Figure 76: Runway Length Criteria Assessment



Runway Length Assessment Key Findings

System-wide, a majority of airports meet the runway length performance objective. Weakest performance on the runway length objective is among Local Community airports – over half the airports with fewer than ten based aircraft meet or exceed the desired runway length, while 47 percent of airports with ten or more based aircraft meet the objective.

Parallel Taxiway

The taxiway criterion relates to whether or not aircraft must taxi on the runway before takeoff or after landing. The lack of a full-length parallel taxiway connected to both ends of a runway reduces its capacity for aircraft operations. A parallel taxiway enhances safety by reducing the potential of taxiing aircraft colliding with aircraft departing or arriving on the runway. A full-length parallel taxiway is desirable for any airport and considered "fundamental" NPIAS airport development by FAA Order 5090.3C. However, a full-length parallel taxiway can be very expensive to build and a low priority at low-activity airports.

FAA design standards do not require runways to have parallel taxiways except in the following specific circumstances:

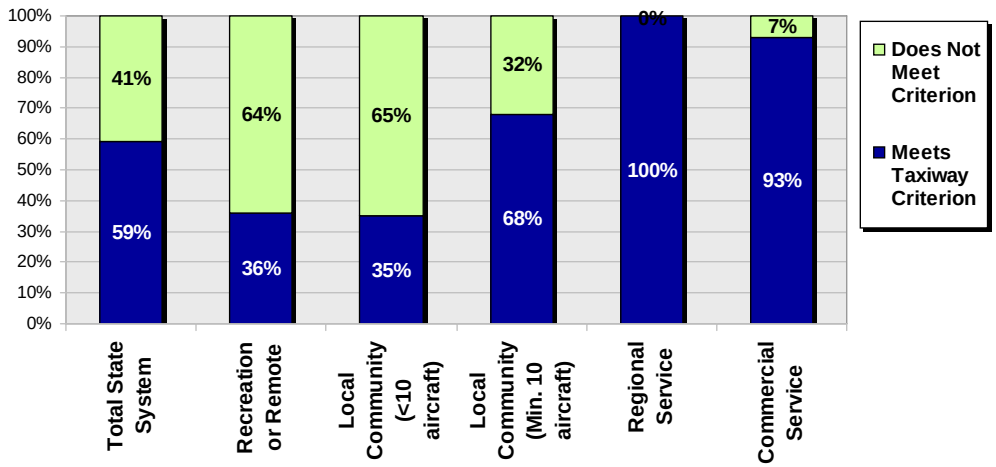
- A parallel taxiway is required for a runway to have an instrument approach with visibility minimum lower than one statute mile. The instrument approach may be one that uses WAAS or other navigational aids. (A parallel taxiway is recommended for runways with higher visibility minimum instrument approaches.)

- One of FAA's runway gradient standards is for a runway to provide line of sight from one end to the other at a point five feet above the runway. If the runway has a full length parallel taxiway, the line of sight requirement is only for each half of the runway.

FAA Order 5100.38C states that a partial parallel taxiway may be considered at NPIAS general aviation airports where the cost to construct the full length is excessive and the benefits do not warrant it. Older FAA and International Civil Aviation Organization (ICAO) criteria used 20,000 to 30,000 annual aircraft operations as an activity threshold for a parallel taxiway. The proposed minimum performance taxiway criterion for smaller airports is to have turnarounds at the runway ends. Turnarounds provide areas suitably surfaced and wide enough for aircraft to turn 180 degrees.

The assessment of taxiway criteria appears in Figure 77. A full-length parallel taxiway is the criterion for the first three classifications, while the criterion for the smaller Local Community and Recreation or Remote airports is a turnaround. Nearly all the Commercial Service and Regional Service airports have parallel taxiways. One-third of the Local Community Airports with at least 10 based aircraft lack a parallel taxiway, which is a requirement for an instrument approach with visibility minimum lower than one statute mile, such as is achievable with WAAS.

Figure 77: Taxiway Criteria Assessment



Taxiway Assessment Key Findings

All Commercial Service airports and most Regional Service airports meet the performance objective for parallel taxiways. A majority of Local Community airports with ten or more based aircraft also meet this performance objective. A minority of airports in the Recreation or Remote and Local Community (with fewer than ten based aircraft) classifications have the desired runway turnarounds.

Runway Lighting

Runway lighting refers to the type of edge lighting provided around the runway. Runway lights help pilots identify the runway location as they approach the airport to land.

- The FAA requires High Intensity Runway Lighting (HIRL) or Medium Intensity Runway Lighting (MIRL) for instrument

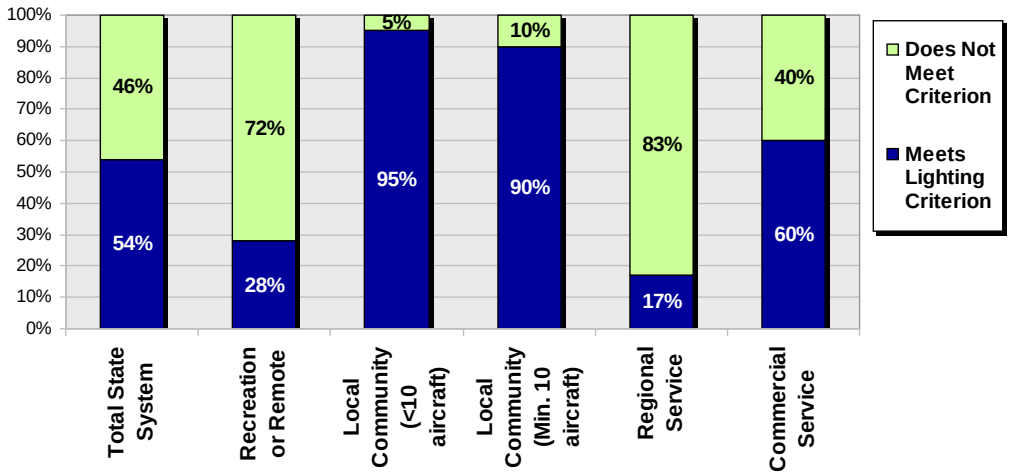
approaches with visibility minimums lower than one statute mile using WAAS or other navigational aids.

- MIRL or Low Intensity Runway Lighting (LIRL) is required for instrument approaches with higher visibility minimums, although the FAA recommends installing MIRL instead of LIRL.

Runway lighting also helps pilots see visual runways at night. Where an airport lacks electrical power or where runway lights are not affordable, reflectors can be used to outline a visual runway. The approaching aircraft's lights are reflected, providing the pilot a better view of the runway location.

As Figure 78 shows, the majority of Commercial Service and Regional Service airports do not meet their criteria for runway edge lighting. For the most part, the type of runway lighting at these airports is consistent with FAA lighting requirements, so the criteria should probably be changed from HIRL to MIRL. For precision and other instrument approaches with visibility minimums lower than ¾ mile, the FAA allows either HIRL or MIRL. Most of the airports in the top two classifications assessed as deficient have MIRL instead of HIRL. Atypically, a large number of Local Community airports meet their lighting criteria. However, most of the Recreation or Remote airports lack reflectors.

Figure 78: Lighting Criteria Assessment



Lighting Assessment Key Findings

A majority of Commercial Service and Local Community airports meet performance objective for runway lighting. Weakest performance in this objective is among airports in the Regional Service and Recreation or

Remote classifications. Most airports shown as deficient in the Commercial Service and Regional Service classifications have MIRL lighting but not the more advanced HIRL lighting identified in the performance objective.

Approach

The type of runway approach available at an airport—visual or instrument—determines whether or not the airport can be used in rainy, foggy, snowy, and dark conditions. Instrument approaches have ceiling and horizontal visibility minimums that determine how bad the weather can be for the airport to remain open. The minimums define the height above and distance from the airport where the pilot must be able to see the runway before committing to landing. FAA design standards differ according to the horizontal visibility minimum, expressed in statute miles.

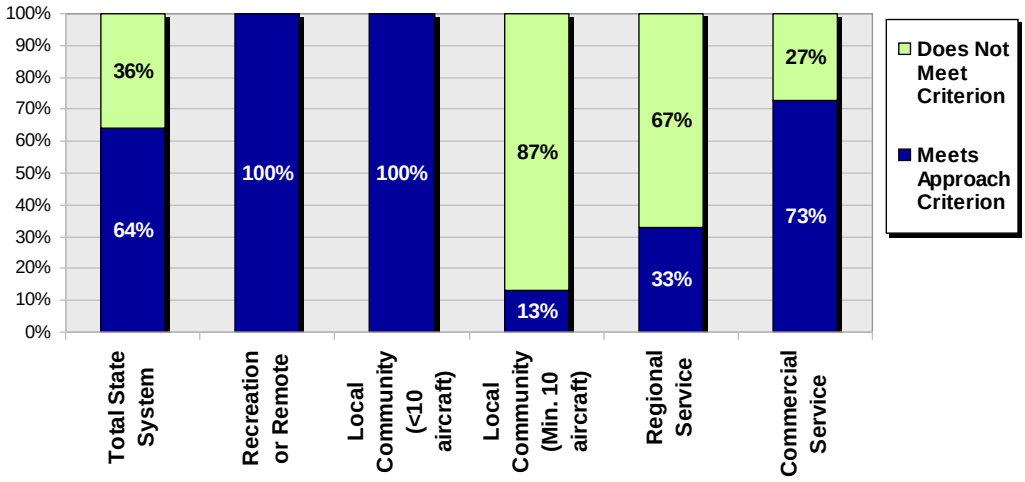
Runway approach instrumentation enhances safety and the level of service. Instrument approaches provide pilots with navigational guidance to ensure they will avoid hazardous obstructions near their path to the runway. Without an instrument approach procedure, a runway can only be used in visual meteorological conditions, which means the pilot can see to avoid terrain and other obstacles while landing. Having an instrument approach that allows the airport to remain open in most weather conditions increases the reliability of air service, which is vital at Commercial Service Airports. Minimal airport closure due to weather "below minimums" is very important at any airport used for business aviation; business aviation typically flies by Instrument Flight Rules (IFR) all the time. An all-weather airport is also important at smaller airports for medical evacuation and other emergency purposes.

Until Global Positioning System (GPS) satellite navigation became available, ground-based navigational aids were required at or near an airport for it to have an instrument approach. Before GPS, there were only non precision and precision instrument approaches, which used a variety of navigational aids. A non precision approach provides a pilot with two-dimensional guidance to a runway, while a precision approach, such as an Instrument Landing System (ILS), also provides a third dimension--glideslope guidance. GPS-aided approaches are three dimensional. However, until the Wide Area Augmentation System (WAAS) was established in 2003, GPS approaches were only possible for visibility minimums comparable to non precision approaches — one statute mile. WAAS consists of ground-based transmitters located around the country to improve the accuracy of GPS signals. WAAS-aided GPS approaches

are possible down to one-half mile visibility minimum—comparable to an ILS.

As Figure 79 shows, Local Community airports with at least 10 based aircraft are the most deficient with respect to the type of approach. This correlates with the fact that many of these airports lack the parallel taxiway, sufficient runway length, and weather reporting equipment needed for an instrument approach. The fact that two-thirds of Regional Service airports lack precision instrument approaches means that they do not meet one of the most desirable factors for business aviation. Local Community Airports with fewer than 10 aircraft and Recreation or Remote airports fully meet the criterion of having visual approaches.

Figure 79: Approach Criteria Assessment



Approach Assessment Key Findings

A majority of Commercial Service airports meet the performance objective and have a precision or ½ mile visibility minimum approach. All Recreation or Remote and Local Community (with less than ten based aircraft) classifications have a visual approach or better. A select number of airports in the Regional Service and Local Community (with ten or more based aircraft) airports meet the performance objective for approach capability.

Vertical Glide Slope Indicators (VGSI)

VGSI are navigational aids used during visual approaches. Lights convey to the pilot whether the aircraft is on the appropriate glide path to the

runway threshold. Specifically, the various sequences of lights convey to the pilot whether the aircraft is on above, below or on the appropriate glide path to the runway threshold. Several different types of VGSI are in use, including PAPI, VASI, PLASI, and PVASI and are detailed as followed:

- **Precision Approach Path Indicator (PAPI) –** A lighting system located along side of a runway which contains red and white lights configured in a single row.

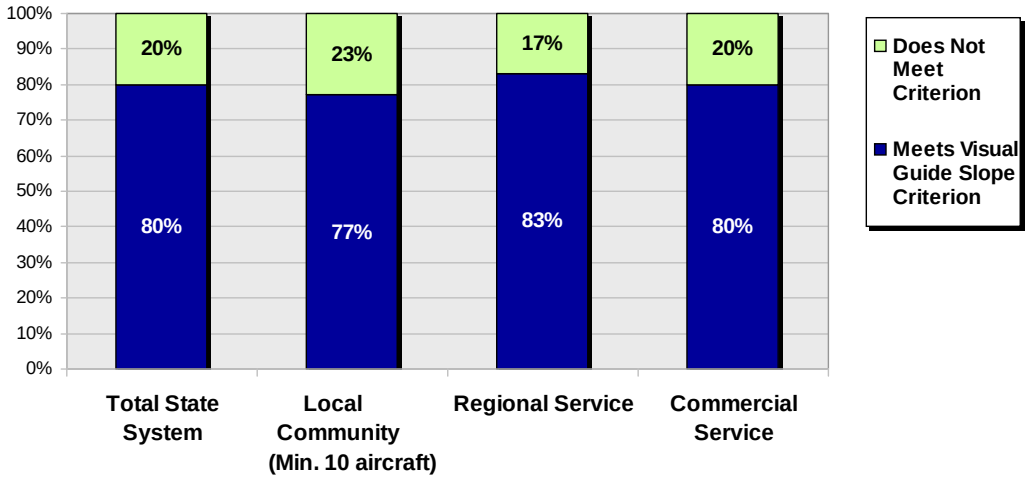
- **Visual Approach Slope Indicator (VASI)** – A lighting system located along side of a runway which contains red and white lights configured using near and far bars (one row of lights in front of the other).

- **Pulsating Visual Approach Slope Indicator (PVASI) or Pulsating Approach Slope Indicator (PLASI) -** A lighting system located along side of a runway which contains either a steady or pulsating red or white light to indicate glide slope position.

These systems improve safety and functioning of visual approaches and are identified in the performance objectives for Commercial Service, Regional Service and Local Community airports with 10 or more based aircraft.

Figure 80 shows that a high proportion of airports meet their VGSI criterion.

Figure 80: Visual Glide Slope Indicator Assessment



Visual Guide Slope Indicator Assessment Key Finding

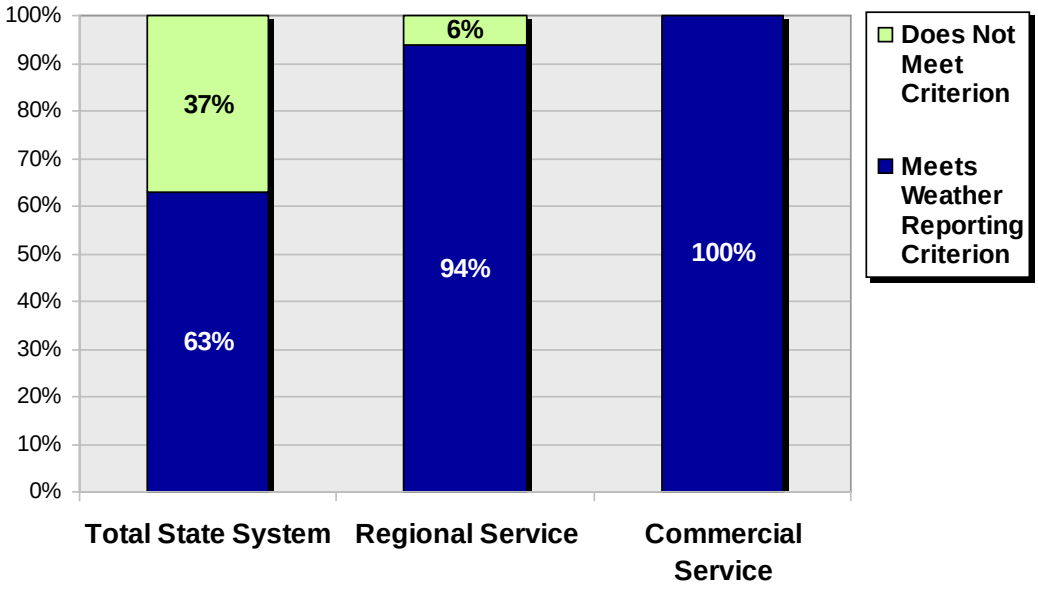
System-wide compliance with this performance objective is high – a majority of Commercial Service, Regional Service and Local Community airports with ten or more based aircraft have the desired systems.

Weather Reporting

Weather reporting on a real-time basis is important to aviation safety, particularly in areas where visibility can decrease quickly. In addition, weather reporting equipment that can provide a certified altimeter reading is required for a runway to have an instrument approach. The types of weather reporting equipment are Automated Weather Observation System (AWOS), Automated Surface Observing System (ASOS), and SuperUnicom, which is a less costly system than AWOS or ASOS that provides pilots with radio checks as well as airport advisories. Weather reporting systems are identified in the performance objectives for Commercial Service, Regional Service and Local Community airports with 10 or more based aircraft. WSDOT is conducting a statewide study to determine where frequent adverse weather conditions may warrant weather reporting equipment at Local Community airports with fewer than 10 based aircraft, at Recreation or Remote airports, or at off-airport locations such as mountain passes.

Figure 81, shows that all the Commercial Service airports and nearly all the Regional Service airports have real-time weather reporting. Most of the Local Community airports with at least 10 based aircraft lack weather reporting systems, which are needed in order to have an instrument approach.

Figure 81: Weather Reporting Assessment



Weather Reporting Assessment Key Findings

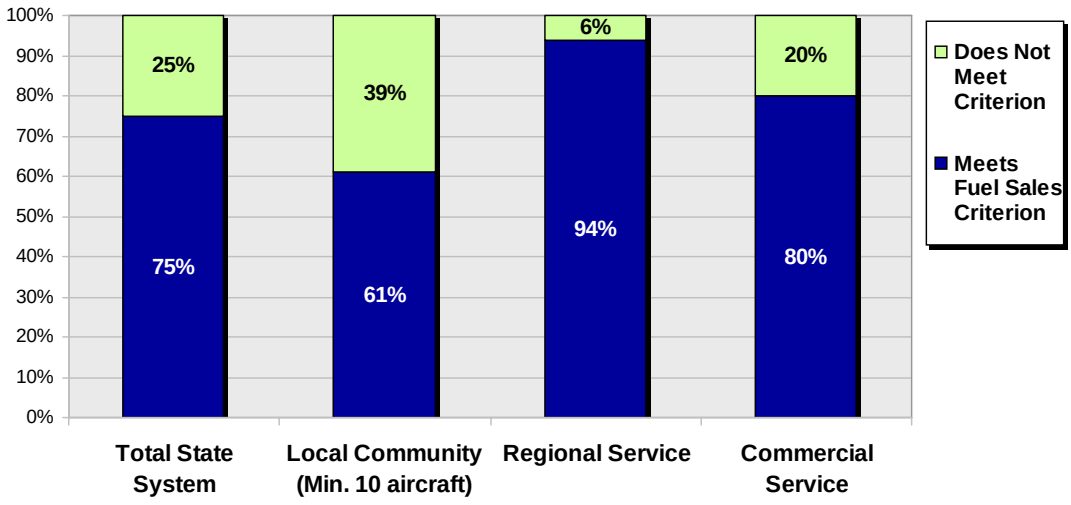
All Commercial Service facilities, and a majority of airports in the Regional Service airports, provide real-time weather reporting. A majority of Local Community airports with ten or more based aircraft do not provide real-time weather reporting.

Fuel Sales

Having fuel available for sale is an airport service that supports the viability of an airport and represents a potential source of revenue for the owner/operator. However, the investment in fuel-dispensing systems and storage is not economically feasible at low activity airports. Airports typically used only by piston-driven aircraft need 100LL (100 octane low lead) fuel available. Airports that are used frequently by jet and turbojet aircraft also need Jet A fuel available for sale. Fuel sales are identified in the performance objectives for Commercial Service, Regional Service and Local Community airports with 10 or more based aircraft.

Figure 82 shows that most of the airports with fuel sales and aircraft maintenance service criteria meet the criteria.

Figure 82: Fuel Sales Assessment



Fuel Assessment Key Findings

Regional Services airports provide the highest availability of fuel sales. Only 60 percent of Local Community airports with ten or more based aircraft provide fuel sales.

Maintenance

Having aircraft maintenance service available is also important, particularly at larger airports. This service provides annual maintenance checks that are required by the FAA for aircraft to operate. Maintenance levels identified for performance criteria are Full-Service Fixed Base Operator (FBO), Major Maintenance, and Minor Maintenance.

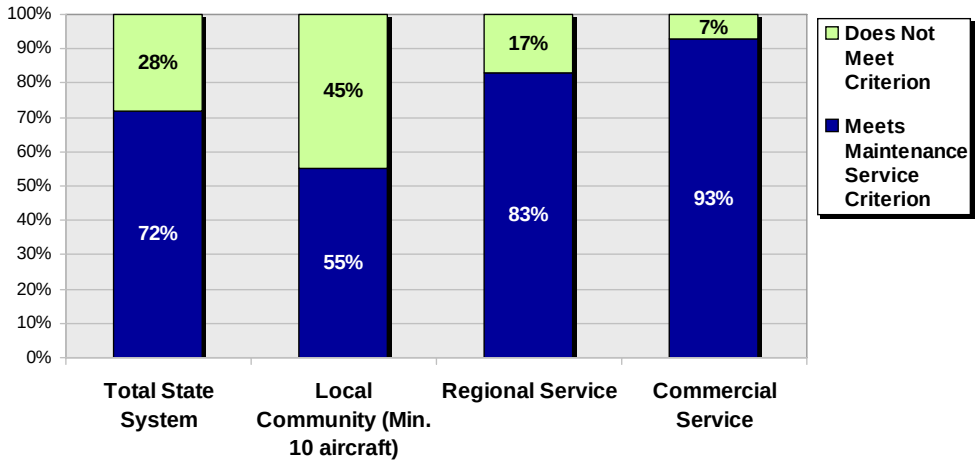
- A Full-Service FBO is understood to be a business at an airport that provides a range of aircraft services, usually in addition to fuel sales. The FAA defines a fixed base operator as "an individual or firm operating at an airport and providing general aircraft services such as maintenance, storage, and ground and flight instruction." In their minimum standards for commercial aeronautical activities, airport owners often establish facility and service thresholds for businesses to be considered FBOs.

- Major Maintenance refers to repairs that may affect weight, balance, structural strength, power plant operations, flight characteristics, or other qualities affecting air worthiness.

- Minor Maintenance is general or preventative maintenance other than major maintenance.

Full-Service FBO and major maintenance service are identified as performance objectives at Commercial Service and Regional Service airports. Minor maintenance is identified as a measure for Local Community Airports with 10 or more based aircraft.

Figure 83: Maintenance Assessment



Maintenance Assessment Key Findings

There is lower availability of maintenance service at Regional Service airports than at Commercial Service airports. Just over half the Local Community airports with ten or more based aircraft provide some type of maintenance service.

How is the Aviation System Performing Based on Objectives Set for Each Classification?

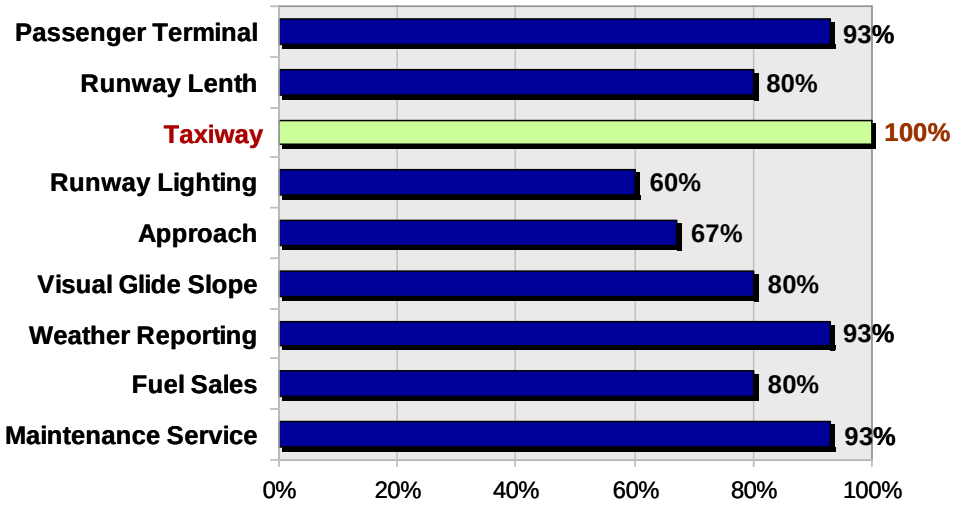
Criteria for Commercial Service Airports

Figure 84 presents the minimum performance criteria proposed for Commercial Service Airports and the percentage of the 15 airports in that draft classification that meet the criteria. The 5,500-foot minimum runway length is the minimum length recommended for heavy business jets (75,000 pounds) by the National Business Aviation Association (NBAA) at standard conditions, where standards are sea level and 59 degrees F. This minimum runway length is also adequate for most regional jets used for commercial passenger service. Airport conditions may warrant a longer runway or an individual airport may require a longer runway for its critical design aircraft.

Figure 84: Performance Criteria for Commercial Service Airports

Criteria	Explanation	Airports Meeting Criteria
Passenger Terminal	Yes	93%
Runway Length	5,500 ft.*	80%
Taxiway	Parallel	100%
Runway Lighting	HIRL	60%
Approach	Precision, or ½ mile visibility minimum	67%
Visual Glide Slope Indicator	Yes	80%
Weather Reporting	AWOS or ASOS	93%
Fuel Sales	100LL and Jet A	80%
Maintenance Service	Full Service FBO and major maintenance	93%

Commercial Service Airports Level of Performance by Criteria



**NBAA minimum recommendation for heavy business jets (75,000 pounds) at standard conditions (59 degrees F and sea level). Airport conditions may warrant a longer runway or an individual airport may require a longer runway for its critical design aircraft.*

Figure 85 lists the airports that do not meet the proposed criteria for Commercial Service Airports. Runway lighting, VGSI, and instrument approach criteria are all inapplicable for Kenmore Air Harbor, Inc. because it is a seaplane base. The airports not meeting the minimum runway length are all airports located in the San Juan Islands and have runways between 2,900 and 3,400 feet long. All the airports lacking HIRL have runway lighting. Anacortes, Orcas Island, Pangborn Memorial, and Wm. R. Fairchild International Airports have Medium Intensity Runway Lights (MIRL), while Grant County International Airport has nonstandard HIRL. Anacortes and Orcas Island have visual approaches only, while Friday Harbor and Pangborn Memorial have non precision instrument approaches with one mile and 1-1/4 miles visibility approach minimums, respectively.

The three airports in Figure 85 that do not meet the fuel sales criteria have 100LL available for sale, but not Jet A. Friday Harbor's online survey indicates an FBO and minor maintenance at the airport, but no major maintenance, although the Airport Master Record indicates major airframe and powerplant repair service is available.

Figure 85: Commercial Service Airports Not Meeting Criteria

Criteria	Airports Not Meeting Criteria
Passenger Terminal	Anacortes
Runway Length	Anacortes, Friday Harbor, Orcas Island
Taxiway	None
Runway Lighting	Anacortes, Grant County International, Kenmore Air Harbor, Inc., Orcas Island, Pangborn Memorial, Wm. R. Fairchild International
Approach	Anacortes, Friday Harbor, Orcas Island, Pangborn Memorial*
Visual Glide Slope Indicator (VGSI)	Kenmore Air Harbor, Inc., Pangborn Memorial, Walla Walla Regional
Weather Reporting	Anacortes
Fuel Sales	Friday Harbor, Kenmore Air Harbor, Inc., Orcas Island
Maintenance Service	Friday Harbor

*Pangborn Memorial has a precision approach, but the visibility minimum is 1 mile.

Anacortes and Orcas Island are among the most deficient airports in the draft Commercial Service Airport classification. Based upon draft 2005 passenger enplanement data, these two airports no longer meet the FAA criteria for primary or non-primary Commercial Service Airports.

Commercial Service Airport Key Findings

A majority of airports meet all seven performance objectives identified for this classification. Although a majority of airports have adequate systems, the weakest performance in this classification is in the runway lighting and approach capability. Runway lighting is critical to enhanced safety on the airfield - these criteria should be examined further.

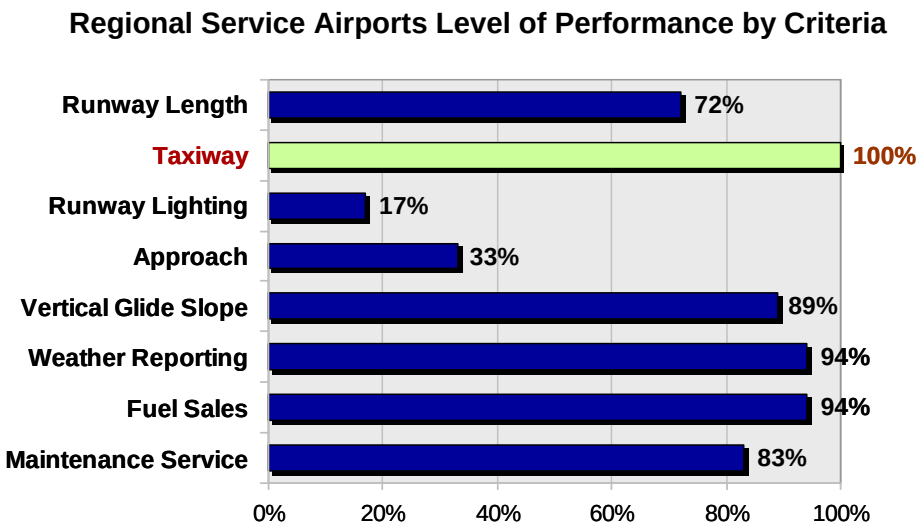
Criteria for Regional Service Airports

The performance criteria for Regional Service Airports, as well as the criteria for inclusion of airports in the Regional Service classification, are based on the assumption that these airports may someday become Commercial Service Airports. Population growth and other changes in air service market conditions may bring commercial service to them in the future or they may need to replace a Commercial Service Airport in case of a natural disaster.

Figure 86 lists the minimum performance criteria proposed for the 18 Regional Service Airports and the percentages of airports meeting the criteria. The runway length is the minimum recommended by NBAA for medium business jets (40,000 pounds) at standard conditions (sea level and 59 degrees F). Airport conditions may warrant a longer runway or an individual airport may require a longer runway for its critical design aircraft. The approach visibility minimum is slightly higher than the minimum for Commercial Service Airports. Other Regional Service Airport criteria are the same as Commercial Service Airport criteria.

Figure 86: Performance Criteria for Regional Service Airports

Criteria	Explanation	Airports Meeting Criteria
Runway Length	5,000 ft.*	72%
Taxiway	Parallel	100%
Runway Lighting	HIRL	17%
Approach	Precision, or lower than ¾ mile visibility minimum	33%
Vertical Glide Slope Indicator	Yes	89%
Weather Reporting	AWOS or ASOS	94%
Fuel Sales	100LL and Jet A	94%
Maintenance Service	Full Service FBO and Major Maintenance Available	83%



**NBAA minimum recommendation for medium business jets (40,000 pounds) at standard conditions (59 degrees F and sea level). Airport conditions may warrant a longer runway or an individual airport may require a longer runway for its critical design aircraft.*

Figure 87 lists the airports that do not meet the proposed criteria for Regional Service Airports. The four airports lacking a runway 5,000 feet long have runways that range between 2,671 feet and 4,654 feet long. All of the airports have primary runways with full-length parallel taxiways or nonparallel taxiway connections to both thresholds, such as at Harvey Field. The greatest deficiencies are for HIRL and precision instrument approaches/visibility minimums lower than ¾ statute mile. All of the airports have runway lighting. Most have MIRL that is sufficient for their instrument approaches. Harvey Field, Kelso-Longview, and Renton Municipal have nonstandard runway lighting.

Of the 12 airports lacking a precision instrument approach, only two lack any sort of instrument approach. High percentages of airport have VGSI, weather reporting, and 100LL/Jet A fuel sales. Auburn Municipal has 100LL but lacks Jet A fuel. The five airports reported as lacking both a full-service FBO and major aircraft maintenance warrant closer examination. All five airports have FBOs reported in the inventory database and on the AirNav Web site; all five are listed as having major airframe and power plant repair in the Airport Master Records, but their inventory databases exclude major aircraft maintenance.

Figure 87: Regional Service Airports Not Meeting Criteria

Criteria	Airports Not Meeting Criteria
Runway Length	Auburn Municipal, Harvey Field, Kelso-Longview, Omak, Richland
Taxiway	None
Runway Lighting	Arlington Municipal, Auburn Municipal, Bowers Field, Columbia Gorge Regional/The Dalles, Deer Park Municipal, Felts Field, Harvey Field, Kelso-Longview, Olympia, Omak, Renton Municipal, Richland, Sanderson Field, Skagit Regional, Tacoma Narrows
Approach	Arlington Municipal, Auburn Municipal, Bowers Field, Columbia Gorge Regional/The Dalles, Deer Park Municipal, Harvey Field, Kelso-Longview, Omak, Renton Municipal, Richland*, Sanderson Field, Skagit Regional
Vertical Glide Slope Indicator	Columbia Gorge Regional/The Dalles, Harvey Field
Weather Reporting	Harvey Field
Fuel Sales	Auburn Municipal
Maintenance Service	Auburn Municipal, Bowers Field, Columbia Gorge Regional/The Dalles

*Richland has a nonprecision approach with ¾ mile visibility minimum.

Regional Service Airport Key Findings

A majority of Regional Service airports meet five of the seven performance objectives identified for this classification: AWOS or ASOS weather reporting, fuel sales, Vertical Guide Slope Indicator, runway length and maintenance service. All but five airports in this classification (72 percent) meet the performance objective for runway length and are adequate to accommodate medium business jets. Airports in this classification had the weakest performance on approach capability (33 percent) and runway lighting (17 percent).

Criteria for Local Community Airports

Proposed minimum performance criteria for Local Community Airports are slightly more demanding for airports with 10 or more based aircraft than for airports with fewer than 10 based aircraft. For the airports with at least 10 aircraft, the minimum runway length, need for a parallel taxiway,

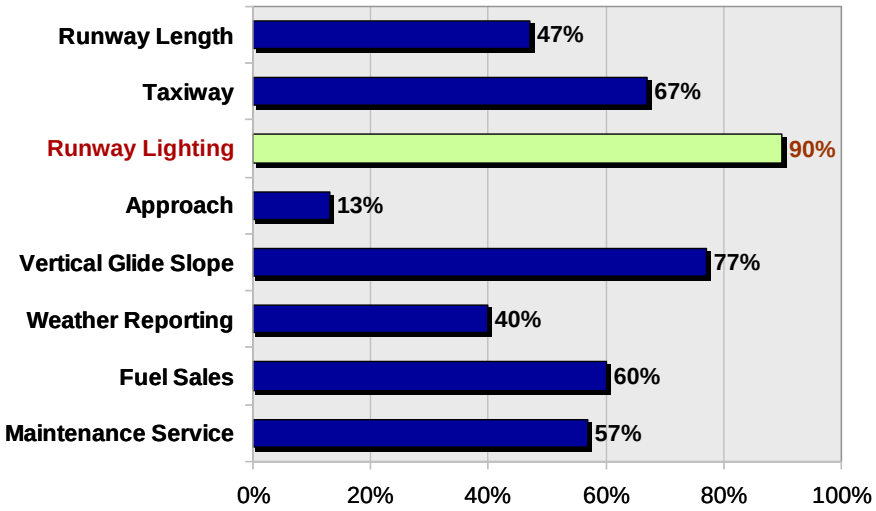
instrument approach, and weather reporting criteria all relate to facilities required by FAA for instrument approaches.

Figure 88 presents the proposed minimum performance criteria for the Local Community Airports (10 or More Based Aircraft) and the percentages of the 31 airports in this draft classification that meet the criteria. The minimum runway length, 3,200 feet, is the minimum required by FAA for an instrument approach with visibility minimum lower than one statute mile. However, runways as short as 2,400 ft. could support an instrument approach provided the lowest Height Above Threshold (HAT) is based on clearing any 200-foot obstacle approach within the final approach segment. A runway 3,200 feet long would be adequate for between 95 percent and 100 percent of the small airplane fleet with fewer than 10 passenger seats, at sea level and 65 degrees F design temperature. An airport's specific conditions or critical design aircraft may require a longer runway.

Figure 88: Performance Criteria for Local Community Airports (10 or More Based Aircraft)

Criteria	Explanation	Airports Meeting Criteria
Runway Length	3,200 ft.*	48%
Taxiway	Parallel	68%
Runway Lighting	MIRL	90%
Approach	Nonprecision, 1 mile visibility minimum	13%
Vertical Glide Slope Indicator	Yes	77%
Weather Reporting	Superunicom	40%
Fuel Sales	100LL	61%
Maintenance Service	Minor Service	55%

Local Community More than 10 Based Aircraft Airports
Level of Performance by Criteria



**According to FAA Advisory Circular 5300-13, Change 9, 3,200 ft. is the minimum required at an airport with instrument approach visibility minimum lower than 1 mile. However, runways as short as 2,400 ft. could support an instrument approach provided the lowest Height Above Threshold (HAT) is based on clearing any 200-foot obstacle approach within the final approach segment. An individual airport may require a longer runway for its specific conditions or critical design aircraft.*

Figure 89 lists the airports that do not meet the proposed criteria for Local Community Airports (10 or More Based Aircraft).

Figure 89: Local Community Airports Not Meeting Criteria (10 or More Based Aircraft)

Criteria	Airports Not Meeting Criteria
Runway Length	Blaine Municipal, Cashmere Dryden, Colville Municipal, Concrete Municipal, Davenport Municipal, Grove Field, Jefferson County International, Lopez Island, Moses Lake Municipal, Odessa Municipal, Okanogan Legion, Rosalia Municipal, Tonasket Municipal, Waterville, Wilbur Municipal, Willard Field
Taxiway	Anderson Field, Chelan Municipal, Concrete Municipal, Davenport Municipal, Goldendale Municipal, Okanogan Legion, Othello Municipal, Toledo-Winlock Ed Carlson Memorial Airport, Waterville, Willard Field
Runway Lighting	Concrete Municipal, Davenport Municipal, Lopez Island, Sunnyside Municipal
Approach	Anderson Field, Blaine Municipal, Cashmere Dryden, Chelan Municipal, Colville Municipal, Concrete Municipal, Davenport Municipal, Dorothy Scott Municipal, Goldendale Municipal, Grove Field, Jefferson County International, Lopez Island, Moses Lake Municipal, Odessa Municipal, Okanogan Legion, Othello Municipal, Prosser, Rosalia Municipal, Sand Canyon, Sunnyside Municipal, Ed Carlson Memorial Airport, Tonasket Municipal, Vista Field, Waterville, Whitman County Memorial, Wilbur Municipal, Willard Field
Vertical Glide Slope Indicator	Concrete Municipal, Davenport Municipal, Odessa Municipal, Okanogan Legion, Whitman County Memorial, Wilbur Municipal, Willard Field
Weather Reporting	Anderson Field, Cashmere Dryden, Colville Municipal, Concrete Municipal, Davenport Municipal, Dorothy Scott Municipal, Goldendale Municipal, Moses Lake Municipal, Odessa Municipal, Okanogan Legion, Othello Municipal, Sand Canyon, Sunnyside Municipal, Ed Carlson Memorial Airport, Tonasket Municipal, Waterville, Whitman County Memorial, Willard Field
Fuel Sales	Anderson Field, Cashmere Dryden, Concrete Municipal, Goldendale Municipal, Grove Field, Lopez Island, Moses Lake Municipal, Odessa Municipal, Sand Canyon, Tonasket Municipal, Whitman County Memorial
Maintenance Service	Blaine Municipal, Davenport Municipal, Goldendale Municipal, Lopez Island, Odessa Municipal, Othello Municipal, Prosser, Rosalia Municipal, Sunnyside Municipal, Tonasket Municipal, Vista Field, Waterville, Whitman County Memorial, Wilbur Municipal

Local Community Airport (10 or More Based Aircraft) Key Findings

A majority of Local Community airports meet the performance objective for runway lighting, Vertical Glide Slope Indicator, parallel taxiway and fuel sales. Local Community airports had the weakest performance on runway length (48 percent) and superunicom weather reporting (40 percent).

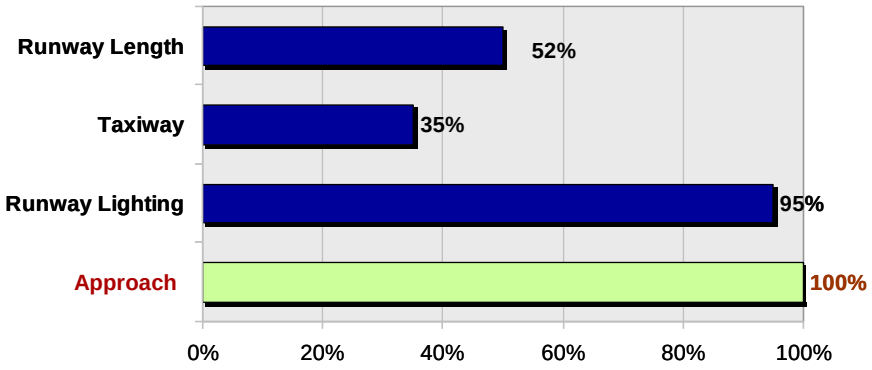
Figure 90 presents the proposed minimum performance criteria for the 20 Local Community Airports (Less Than 10 Based Aircraft) and the percentages of the airports in this draft classification that meet the criteria. The minimum runway length is 2,800 feet, which is nominally the length required for 95 percent of the small aircraft fleet with fewer than ten seats at sea level and 65 degrees design temperature.

Figure 90: Performance Criteria for Local Community Airports (Less than 10 Based Aircraft)

Criteria	Explanation	Airports Meeting Criteria
Runway Length	2,800 ft.*	50%
Taxiway	Turnaround at each end	35%
Runway Lighting	Reflectors	95%
Approach*	Visual	100%

*By default, all runways have visual approaches.

Local Community Less than 10 Based Aircraft Airports Level of Performance by Criteria



**2,790 ft. is the length required by FAA software for 95 percent of the small aircraft fleet with fewer than 10 seats at sea level and 85 degrees F.*

Figure 91 lists the airports that do not meet the proposed criteria for Local Community Airports (Less Than 10 Based Aircraft).

Figure 91: Local Community Airports Not Meeting Criteria (Less Than 10 Based Aircraft)

Criteria	Airports Not Meeting Criteria
Runway Length	Cle Elum Municipal, Darrington Municipal, Forks Municipal, Mansfield, Ocean Shores Municipal, Packwood, Port of Ilwaco, Strom Field, Twisp Municipal, Westport
Taxiway	Darrington Municipal, Ferry County, New Warden, Packwood, Port of Ilwaco, Quincy Municipal, Sekiu, Strom Field, Westport, Wilson Creek
Runway Lighting	Wilson Creek
Approach	None

Local Community Airport (Less than 10 Based Aircraft) Key Findings

Performance on the runway lighting objective is high for Local Community Airports (Less than 10 Based Aircraft) – all but one airport have reflectors or a more advanced lighting system. Just over half the airports in this classification meet the performance objective for runway length. Almost 40 percent of Local Community airports meet the safety performance objective for providing a runway turnaround or parallel taxiway.

Criteria for Recreation or Remote Airports

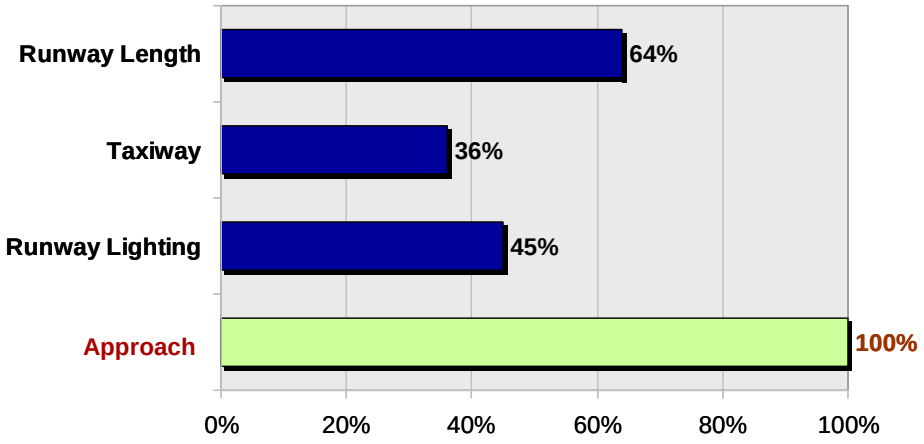
Proposed minimum performance criteria for Recreation or Remote Airports are similar to the criteria for Local Community Airports (Less Than 10 Based Aircraft), except that the minimum runway length is shorter. The length of 2,400 feet is the minimum for an instrument approach according to FAA criteria, provided the HAT is based on clearing any 200-foot obstacle approach within the final approach segment. A runway length of 2,400 feet would be adequate for between 75 percent and 95 percent of the small aircraft fleet with fewer than 10 seats at sea level and 65 degrees F design temperature. Specific airport conditions or critical design aircraft may require a longer runway.

Figure 92 presents the proposed performance criteria for the Recreation or Remote Airports and the percentages of the 47 airports in this draft classification that meet the criteria.

Figure 92: Performance Criteria for Recreation or Remote Airports

Criteria	Explanation	Airports Meeting Criteria
Runway Length	2,400 ft.*	64%
Taxiway	Turnaround at each end	36%
Runway Lighting	Reflectors	45%
Approach	Visual	100%

Recreation or Remote Airports Level of Performance by Criteria



**Min. for instrument approach and adequate for between 75 percent and 95 percent of small aircraft with fewer than 10 seats at sea level and 65 degrees F. Airport conditions or critical design aircraft may require a longer runway.*

Figure 93 lists the airports that do not meet the proposed criteria for Recreation or Remote Airports.

Figure 93: Recreation or Remote Airports Not Meeting Criteria

Criteria	Airports Not Meeting Criteria
Runway Length	Avey Field State, Bandera State, Camano Island Airfield, DeVere Field, Elma Municipal, Evergreen Field, Firstair Field, Hoskins Field, J-Z, Lester State, Rogersburg State, Shady Acres, Sky Harbor, Skykomish State, Sullivan Lake State, Vashon Municipal, Woodland State
Taxiway	Bandera State, Cedars North Airpark, Copalis State, Cross Winds, Easton State, Elma Municipal, Goheen Field, Hillcrest, Hoskins Field, J-Z, Lake Wenatchee State, Lester State, Little Goose Lock & Dam State, Lost River Resort, Lower Granite State, Lower Monumental State, Lynden Municipal, Martin Field, Point Roberts Airpark, R & K Skyranch, Ranger Creek State, Rogersburg State, Sky Harbor, Skykomish State, Stehekin State, Sullivan Lake State, Tieton State, Vashon Municipal, Western Airpark, Whidbey Airpark
Runway Lighting	Bandera State, Camano Island Airfield, Cedars North Airpark, Copalis State, Cross Winds, Firstair Field, Fly For Fun, Hoskins Field, J-Z, Lake Wenatchee State, Lester State, Little Goose Lock & Dam State, Lost River Airport, Lower Granite State, Mead Report, Point Roberts Airpark, Quillayute, Ranger Creek State, Rogersburg State, Sky Harbor, Skykomish State, Stehekin State, Sullivan Lake State, Tieton State, Whidbey Airpark
Approach	None

Recreation or Remote Airport Key Findings

A majority of airports in this classification – 64 percent – meet the performance objective for runway length. The runway turnarounds and reflectors are safety objectives that are currently met by a minority of airports in the Recreation or Remote classification.

Criteria for Seaplane Bases

Figure 94 presents the proposed minimum performance criteria for Seaplane Bases and the percentages of the ten airports in this draft classification that meet the criteria.

Figure 94: Performance Criteria for Seaplane Bases

Criteria	Explanation	Airports Meeting Criteria
Dock Facility	Yes	90%
Approach	Visual	100%

Seaplane Bases Level of Performance by Criteria

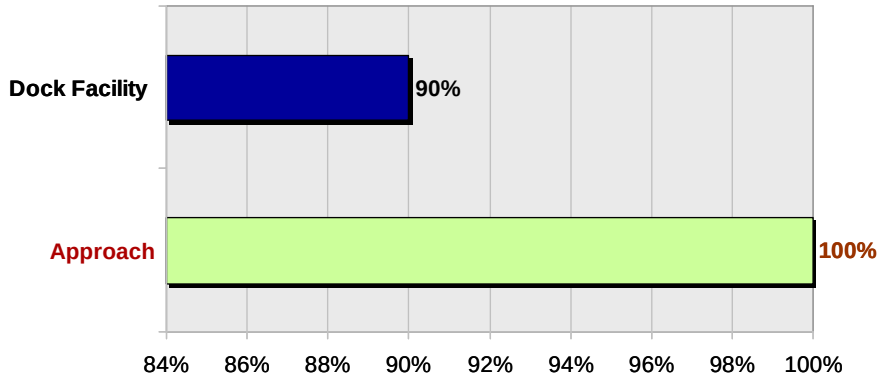


Figure 95 lists the Seaplane Bases that do not meet the proposed criteria. The determination of dock facilities was from information available in the Airport Facility Directory, Washington State Pilots Guide, and AirNav.com. Seaplane Bases charging landing fees, selling fuel, providing maintenance, and having adjacent boat docks were assumed to have dock facilities for airplanes.

Figure 95: Seaplane Bases Not Meeting Criteria

Criteria	Airports Not Meeting Criteria
Dock Facility	Skyline SPB
Approach	None

Seaplane Base Key Findings

Seaplane bases in Washington's aviation system have adequate approach capabilities to meet the needs of users. Almost all seaplane bases have dock facilities that support operations. Only one seaplane base requires a dock.